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Empirical Evidence from Indonesia

Comparison of Different Child Poverty Measures: Empirical Evidence from Indonesia

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Abstract

The aim of this thesis was to investigate the extent and nature of child poverty in Indonesia through comparing different child poverty measures. Further, given different conceptualisations of poverty, a secondary aim was to consider which approach to assessment of child poverty is most useful in the Indonesian context.

The aim was met using secondary analysis of existing data sets, the Indonesian family life survey (IFLS) 5 and IFLS East, conducted in 2014 and 2012 respectively. This thesis developed, used, and compared monetary and multidimensional measures (absolute and relative deprivation) of child poverty. The analysis of monetary poverty estimated poverty based on expenditure relative to absolute and relative poverty thresholds. The absolute deprivation measure used a human rights-based approach to identify domains and indicators. The relative deprivation measure identified the preliminary list of items based on domains and indicators from previous studies in Indonesia and then selected reliable, valid and additive items for the analysis.

The final sample consisted 13,192 households and 21,396 children. Using these analyses, 8.7 million (10.4%) of Indonesian children live in absolute monetary poverty, 14.5 million (17.3%) in absolute deprivation and 21.5 million (25.7%) in relative deprivation. Although there are 28.4 million children (34%) who are poor according to one of those measures, only 3.2 million (3.9%) of children suffer all three types of child poverty. Subgroup comparison shows children in rural area and outside Java, in non-Muslim households, in households with more assets, and whose household head had lower levels of education experienced significantly higher rates of poverty (estimated by all measures) than their peers.

There is no best single child poverty measure. However, sensitivity and specificity analysis supported by the receiver operating characteristics (ROC) curve suggested both absolute deprivation and relative deprivation were robust measures of child poverty while monetary measure was less appropriate.

Author’s Declaration

I declare that the work in this dissertation was carried out in accordance with the requirements of the University's *Regulations and Code of Practice for Research Degree Programmes* and that it has not been submitted for any other academic award. Except where indicated by specific reference in the text, the work is the candidate's own work. Work done in collaboration with, or with the assistance of, others, is indicated as such. Any views expressed in the dissertation are those of the author.

SIGNED:

DATE:

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Abbreviation and Acronym

AD	Absolute Deprivation
BAPPENAS	*Badan Perencanaan Pembangunan Nasional* (Indonesian National Development Planning Agency)
BPS	*Badan Pusat Statistik* (Statistics Indonesia)
BSM	*Bantuan Siswa Miskin* (Scholarship for Poor Student)
GOI	Government of Indonesia
GDP	Gross Domestic Product
IDHS	Indonesian Demographic and Health Survey
IFLS	Indonesian Family Life Survey
IRT	Item Response Theory
JAMKESMAS	*Jaminan Kesehatan Masyarakat* (National Health Insurance for the Poor and Near Poor)
KIP	*Kartu Indonesia Pintar* (Smart Indonesia Card)
KIS	*Kartu Indonesia Sehat* (Indonesian Health Card)
KKS	*Kartu Keluarga Sejahtera* (Family Welfare Card)
KPS	*Kartu Perlindungan Social* (Social Protection Card)
KUR	*Kredit Usaha Rakyat* (Credit for people's businesses program)
MCP	Monetary Child Poverty
OHCHR	Office of the United Nations High Commissioner for Human Rights
PKH	*Program Keluarga Harapan* (Family Hope Program)
PNPM Mandiri	*Program Nasional Pemberdayaan Masyarakat Mandiri* (National Program for Community Empowerment)
RD	Relative Deprivation
ROC	Receiver Operating Characteristics
RSS	Raw sum score
SDGs	Sustainable Development Goals
SUSENAS	*Survei Sosial Ekonomi Nasional* (National Socio-economic Survey)
TNP2K	*Tim Nasional Percepatan Penanggulangan Kemiskinan* (The National Team for Acceleration of Poverty Reduction)
UNCRC	UN Convention on the Rights of the Child
UNICEF	United Nations Children's Fund
WHO	World Health Organization

CHAPTER 1. INTRODUCTION

1.1 The Importance of Studying Child Poverty in Indonesia

Child poverty is a global issue. It exists in every part of the world, in both developed and developing countries. About 19.5% (385 million) children in the world experience extreme poverty based on the World Bank's monetary poverty standard (World Bank and UNICEF, 2016). Gordon et al. (2003) found in the early 2000s that approximately one-third of the children in developing countries were experiencing multiple deprivations. Specifically, in the developing world, the highest level of child poverty was found in South Asia and Africa. In these regions, more than 80% of children were experiencing child poverty, with shelter and sanitation posing the largest problems. In East Asia and the Pacific, child poverty is considerably lower, at only about 7%. However, some Southeast Asian countries, such as Indonesia, the Philippines, and Cambodia, have rates of child poverty that are higher than the average in the region, reaching 19.8%, 19.8%, and 70.8% respectively (Gordon et al., 2003).

Child poverty has various negative effects on children. Child poverty is a barrier that inhibits children's development, children's participation in society, and children's access to proper education, health care, and other basic services. Children living with child poverty are also more likely to live in unhealthy housing without proper sanitation and clean water (Advis and Rico, 2012; Bima and Marlina, 2017; Bima et al., 2017; Gordon et al., 2012; Gordon et al., 2003; Minujin and Delamonica, 2012; Nandy, 2012; Notten et al., 2012; Rizky et al., 2017; Roelen, 2010; Roelen et al., 2012; SMERU, 2011; Yousefzadeh et al., 2012).

Furthermore, child poverty tends to continue the poverty cycle in the long term and is one of the causes of poverty transmission across generation (inter-generational poverty). Child poverty reduces children's opportunities to function successfully in adulthood. Poor children are more likely to have inferior adult achievement compared to non-poor children as a result of deprivation during their childhoods (Duncan et al., 1998; Oshio et al., 2009; Ratcliffe and McKernan, 2010). Poor children who become poor adults are more likely to have poor children in the future (Bird, 2007; Moore, 2005) because poor parents are often

unable to create opportunities for their children to escape poverty (Gordon, 2018; Townsend, 1979).

The eradication of child poverty is a global policy objective. Eradication of child poverty is integrated in sustainable development goals (BAPPENAS and UNICEF, 2017; Dornan, 2017; UNICEF and Global Coalition against Child Poverty, 2017). It is also enshrined in the UN Convention on the Rights of the Child (UNCRC) (Pemberton et al., 2012; Pemberton et al., 2007). Every country in the world is now expected to be responsible for eradication of child poverty within its borders (Child Poverty Unit, 2009; CPAG, 2015; Global Coalition against Child Poverty, 2015; SMERU, 2011; UNICEF, 2000; 2005; n.d.; UNICEF and Global Coalition against Child Poverty, 2017).

The objective of eradicating child poverty elicits new questions about how to generate evidence in support of policy making. Valid and reliable evidence, for example, on the extent and nature of child poverty, is required to develop effective policy and intervention to reduce child poverty. The need for valid and reliable evidence is stimulating new debates about the methods used to measure and analyse the extent to which children are living in poverty, especially in the practical context of the *child poverty* definition, and the means of measurement. Without evidence, policies may provide little benefit to protect poor children and fail to lift them from poverty (Badame et al., 2005; Barrientos and DeJong, 2004; Delamonica et al., 2006; Espey et al., 2010; Gordon et al., 2003).

Various measures of child poverty have been introduced, but there is limited agreement as to which is the best. Previous studies have suggested that each measure has its own definitions, assumptions, and sets of indicators and strategies for identifying thresholds (Alkire and Roche, 2012; Bradshaw et al., 2007; Delamonica et al., 2006; Gordon and Nandy, 2012; Main, 2013; Roelen and Gassman, 2008; White et al., 2003). Despite the differences among measures, however, there is agreement that multidimensional analysis specific to children is necessary, particularly with a focus on children as individuals rather than as part of households (De Neubourg et al., 2014; De Neubourg et al., 2012a; b; Ferrone and Chzhen, 2018; Gordon and Nandy, 2012; Gordon et al., 2003; Hjelm et al., 2016; Kim and Nandy, 2018; Roelen, 2010; Roelen and Gassman, 2008).

The selection of measures is crucial to inform policy-making decisions. Children who are poor according to one measure are not necessarily poor according to another measure (Advis and Rico, 2012; Bima and Marlina, 2017; Roelen, 2010; 2017). Thus, when a targeted social policy intervention for the poor is developed based on a single measure, children who are poor according to other measures or criteria may not receive benefit or support (Sparrow, 2006). Therefore, comparison of different child poverty measures would help to identify the strengths and weaknesses of each measure and help to identify the appropriate child poverty measures for specific contexts.

Indonesia is selected as the observed country for personal and academic reasons. As an Indonesian who has first-hand experience of child poverty, the author of this thesis would like to contribute evidence that could help in the eradication of child poverty in Indonesia. From an academic point of view, the selection of Indonesia is also reasonable. The eradication of poverty is a leading policy agenda item in Indonesia, and the UN Convention on the Rights of the Child (UNCRC) is part of national law (GOI, 2002a; b). Nonetheless, the issue of child poverty as a distinct aspect of poverty overall has only recently begun gaining attention. The study of child poverty should be a major topic of study especially in Indonesia, which is one of the emerging middle-income countries that has already ratified the UNCRC and home to more than 83 million children (Kementerian Pemberdayaan Perempuan dan Perlindungan Anak, 2018). Yet the study of child poverty in Indonesia is still in the early stages. Child poverty only entered the radar of academic research with the implementation of recent studies on child poverty that have informed the impact of the 1998 economic crisis on children (Cameron, 2000; Sparrow, 2006; Sumner, 2002), the experience of poor children in Indonesia (Bessell, 2009; Bima et al., 2017; Reality Check Approach Plus and UNICEF Indonesia, 2017; Rizky et al., 2017), and the estimates of child poverty in Indonesia (Bima and Marlina, 2017; Hadiwidjaja et al., 2013; Landiyanto, 2013; SMERU, 2011; UNICEF, 2017a; World Bank, 2015c).

Although some studies exist, the many gaps in the existing literature on child poverty in Indonesia are hindering child poverty reduction efforts in the country. Poverty reduction policy and intervention are not always developed and

implemented with sufficient or appropriate evidence (Sumarto, 2016). As a result, some studies in Indonesia (Bima et al., 2017; Rizky et al., 2017; SMERU, 2011; Sparrow, 2006) have shown that policy and intervention often exclude some poor children. Miss-targeting of the intervention is an indication that the child poverty measures are inappropriate. Indeed, to the author's knowledge, no comparisons of appropriateness of child poverty measures have been undertaken in the context of Indonesia Limited comparison represents a significant gap in knowledge; without this evidence, we cannot comment on the applicability of different child poverty concepts to explain and measure child poverty in Indonesia. Furthermore, without comparison, we cannot identify the appropriate child poverty measure for Indonesian contexts.

1.2 Research Aims and Questions

This thesis aims to fill the gaps in the comparison of child poverty measures and thereby contribute to current understanding of the extent and nature of child poverty in Indonesia. Specifically, this thesis compares the existing child poverty measures using Indonesian data and tests whether different child poverty measures report the extent and nature of child poverty differently. Based on the comparison, this thesis aims to identify the appropriate child poverty measure for Indonesia. To achieve the objectives, this thesis asks the following research questions and sub-questions:

1. What are the sensible and possible ways to assess child poverty in Indonesia?
    a. What are the conceptually coherent approaches to the assessment of child poverty?
    b. What data are available and, therefore, which of the conceptually coherent approaches are possible?
    c. What indicators should be used to define and assess poverty according to each of these approaches?
2. How do estimates of child poverty in Indonesia vary between these different methods?
    a. What is the extent of child poverty identified by each method?
    b. What is the profile of child poverty identified by each method?

c. How sensitive are the thresholds of each method?

3. How do these different methods characterise child poverty in Indonesia?
    a. Which children are included or excluded in each method?
    b. To what extent do poor children experience different types of poverty simultaneously?
    c. Which is the best approach to measuring child poverty in Indonesia, and why?

Through answering the research questions, this thesis not only fills the gap in the literature, but also provides substantial contribution to science, forming the basis for further studies and practices and generating substantial evidence for policy making.

1.3 Thesis Structure

This thesis consists of 9 chapters.

Chapter 1: Introduction

This chapter discusses the rationale for studying child poverty in Indonesia and the aims of the study. This chapter also introduces the research questions and outlines the structure of the thesis.

Chapter 2: Defining and Measuring Child Poverty

This chapter compares child poverty concepts and measures. It also critically reviews the existing child poverty measurement methods in developing countries. This chapter starts by discussing the varied definitions of the terms *children* and *childhood*. This discussion of children and childhoods supports the next stages of the analysis by informing the identification, analysis, and discussion of child poverty from theoretical and empirical perspectives. The discussion then shifts to the definition and measurement of child poverty, which is the core of the theoretical discussion in this chapter. This part of the discussion gives background about the different understandings of child poverty and the conceptual differences behind different child poverty measures. The measures are compared critically, especially the measures of child poverty in developing countries.

Chapter 3: The Context of Children and Poverty in Indonesia

This chapter provides a brief introduction to Indonesia and background information regarding children and poverty in the country, as the study area. The overview provides general information about geography, demographic structure, economy, and governance. The definition and measurement of poverty in Indonesia are reviewed and critically analysed. The policies that are relevant to children and poverty are also explored. Some empirical data based on the existing studies of child poverty in Indonesia provide additional contextual information about Indonesia as a study area.

Chapter 4: Methodology and Data

This chapter addresses questions of data availability and the possible methods to be applied, providing a general overview of the data and methodology for this thesis. The methodological discussion is the basis for the empirical analysis elaborated in the analysis chapters.

Chapter 5: Monetary Child Poverty Measures

This chapter develops and compares absolute and relative approaches to monetary child poverty measures. In addition to using the per capita approach, it uses equivalence scales and discusses how these scales influence estimates of the extent of child poverty.

Chapter 6: Absolute Deprivation among Children

This chapter develops a measure of absolute deprivation among children. In addition to conducting a multiple deprivation analysis, this chapter also compares the level of deprivation of each domain.

Chapter 7: Relative Deprivation among Children

This chapter develops a measure of relative deprivation among children. It gives a conceptual discussion of how to operationalise relative deprivation in measuring child poverty in Indonesia despite the absence of socially perceived necessities data. It reports estimates of relative deprivation among children in Indonesia.

Chapter 8: Comparing Different Measures of Child Poverty

This chapter compares the profile of child poverty from the different perspectives observed. The empirical results from different child poverty measures are compared, and the overlap between monetary, absolute deprivation, and relative deprivation are explored. This chapter also investigates the accuracy of child poverty measures using latent class analysis to estimate sensitivity and specificity. Finally, the chapter carries out a receiver operating characteristics (ROC) curve analysis.

Chapter 9: Discussion and Conclusion

This chapter discusses some key concepts generated from the findings and how this thesis contributes to the debate about child poverty measures. It also highlights the key evidence answering each research question

CHAPTER 2. DEFINING AND MEASURING CHILD POVERTY

Chapter Summary

This chapter aims to address the theoretical and conceptual debates surrounding the definition of child poverty and consider implications for the measurement of child poverty.

- There is no universal definition or measures of child poverty. Definitions of child poverty need to consider how existing definitions of poverty fit with our understanding of childhood.
- Poverty can be defined as the lack of sufficient resources to participate in society.
- Human rights and human needs are central to understanding poverty.
- Poverty can be understood from an absolute (against a fixed threshold of insufficiency) or a relative (against a moving threshold of insufficiency in a particular context) perspective.
    - Human Rights are absolute.
    - Human needs can be considered as absolute, especially in the context of subsistence and basic needs.
    - Need satisfiers and intermediate needs may vary according to place, time, and culture.
- Childhood is understood as the stage of life from birth to adulthood and is socially constructed as a period distinct from adulthood.
    - Children are understood to have different needs than adults.
    - Children are considered more vulnerable to the effects of poverty than adults.
- In order to measure child poverty, it is necessary to find an operational definition of childhood.
    - Childhood can be also be defined on the basis of a developmental stage, status in law or social context.
    - Childhood is best understood as a social construct, so no absolute definition is possible.
    - Since no single definition is possible, chronological age is often used as a pragmatic marker which (so long as births are registered) can be enforced in law and policy.
- Child poverty can be measured indirectly (Observing the resources that results the experience of poverty) or directly (observing the direct experience of poverty).
    - Indirect measures of child poverty are monetary measures.
    - The direct measures of child poverty are multidimensional measures.
- Both monetary and multidimensional measures are applied in developing countries.

2.1 Poverty: Conceptual Issues

At its simplest definition, being poor means not having enough. However, this definition might include a variety of more specific definitions. This section discusses the fundamental concepts that underlie poverty debates and draws out some of the conceptual challenges in defining poverty. The concepts explored in this section are not mutually exclusive, nor do they neatly summarise the progression of ideas over time. Rather, these concepts represent several fundamentally different understandings of what it means to be poor, often operating on differing interpretations of otherwise similar elements.

2.1.1 Human Rights-Based Approaches to Poverty

Every human being has a legitimate claim to human rights. Moser (2005) describes human rights as legally binding and having a multidimensional character. In general, human rights include the rights to life, survival, integrity, and development. However, the concept of human rights has undergone several transformations. First-generation human rights focus on political rights and civil liberties, while second-generation human rights, which are recognised as lower priority, focus on economic, social, and cultural rights. Due to increasing concerns about economic and social development in poor countries, second-generation rights are gaining increasing attention (Hamm, 2001).

Human rights and poverty share several concepts, especially in the context of social and economic rights. However, poverty cannot be described simply as a violation of human rights. Many disagreements exist as to whether poverty constitutes a violation of human rights. In the earlier periods, legal norms such as the Universal Declaration of Human Rights did not mention freedom from poverty as a human right. Nevertheless, at the time, the United Nations did argue that human rights violations are both causes and products of poverty, and freedom from poverty is a human right (OHCHR, 2004; 2012; UNDP, 2003). Chauvier (2007) and Pogge (2007) argue that poverty may be considered as a violation of human rights if there is an act or omission that causes people to be poor. However, Chauvier (2007) and Pogge (2007) further explain that it is difficult to identify clearly whether certain acts or omissions violate human rights in the context of poverty. Chauvier (2007) identifies three empirical conditions that would need to be met before poverty could be considered as a violation of human

rights. The **first** condition is universal access to being non-poor, wherein all global citizens can be non-poor if they choose. The **second** condition is that poor people are not responsible for their poverty; in other words, poverty cannot exist because of the choices or actions of the impoverished people. The **third** condition is that poverty must be a negative, external result of economic activities. However, even if all of these conditions were satisfied, it would still be difficult to claim that poverty is a violation of human rights. This difficulty lies in the ambiguity of the conditions. For instance, there is no clarity as to what kind of economic activities should be considered as an act that violates human rights.

Although there are disagreements about the position of poverty in human rights discourses, placing freedom from poverty within the human rights framework would be very beneficial for poverty reduction. Since many countries have already ratified human rights, integrating freedom from poverty would provide a normative framework of obligation to states regarding poverty reduction (OHCHR, 2004; 2012; Pemberton et al., 2007; UNDP, 2003). Human rights help to provide universal values and aspirations and enhance the international legitimacy of economic and social rights (OHCHR, 2004; 2012). Human rights are also already contributing to a shift in the policy debate surrounding poverty from viewing poverty as a personal failure to viewing it as a socio-economic structure and policy failure (Pemberton et al., 2007). Integrating freedom from poverty in the human rights framework would thus expand the coverage of poverty reduction policies, encouraging such policies to address the structural discrimination that stimulates and sustains poverty (OHCHR, 2004; 2012; UNDP, 2003).

In addition, it is arguable that integrating a human rights perspective into poverty discourse would help to enrich our understanding of poverty. Human rights have certain standards that must be realised, and some of those standards are relevant to poverty, such as rights to education or rights to health. Freedom, one of the key principles of human rights, is also an important element in poverty discourses. Sen (1999), for example, argues that freedom is an important element of the capability approach.

Therefore, rather than debating whether or not poverty is a violation of human rights, it is more prudent to focus on finding better ways to fulfil those human rights which contribute to reducing poverty.

2.1.2 **Human Needs and Poverty**

The notion of human needs is a fundamental element of poverty debates. Dean (2010) argues that poverty is the manifestation of unmet needs. However, different concepts of needs exist and in turn lead to different concepts of poverty (Dean, 2011; Doyal and Gough, 1991; Kenrick et al., 2010; Sen, 1999; Townsend, 1993).

Townsend (1979; 1993) points out points out that literature on poverty debates up to the 1990s has been based on the work of Rowntree and Booth on physical needs. Maslow (1943) explains that physical needs are any necessities essential for the survival of the human body such as water, oxygen, food, and other sources of nutrition. Maslow (1943) points out that physical needs constitute the lowest level of the hierarchy of needs. These needs should therefore be satisfied before the higher levels of needs are considered. However, Maslow (1943) and Townsend (1979; 1993) also argues that physical needs alone do not sufficient to satisfy all human needs. There are various needs in the higher levels of the hierarchy. For example, beyond physical needs, human needs also include psychological needs such as security, love, and self-esteem (Dean, 2011; Kenrick et al., 2010; Maslow, 1943).

Townsend (1979; 1993) thus argues that, a more comprehensive definition of poverty should include the concept of basic needs. The concept of basic needs incorporates not only maintaining a person's physical condition per the subsistence concept but also meeting the minimum necessities of life. The concept of basic needs, for example, considers access to services that are not necessarily critical to physical needs such as health and education services as essential necessities (Townsend, 1979; 1993). However, although several scholars (Dean, 2011; Doyal and Gough, 1991; Kenrick et al., 2010; Sen, 1999; Townsend, 1979; 1993) have agreed that basic needs are beyond physical needs, there are no clear conceptual boundaries of basic needs.

Doyal and Gough (1991), in proposing a universal concept of basic needs, state that basic needs consist of needs related to physical health and the correspondence of the autonomy of the individual with the individual's ability to think, make decisions, and act. Doyal and Gough also describe intermediate needs, such as needs for food, housing, education, economic security, and

participation, as the needs that must be met in order to meet in turn the basic needs of health and autonomy.

In contrast, Dean (2011) believes that human needs tend to be viewed from either absolute or relative perspectives. From the absolute perspective, human needs are universal and relevant to every human being; from the relative perspective, human needs depend on the society to which the human belongs. In examining the concept of needs, Dean (2011) tries to distinguish between inherent and interpreted definitions of needs. The inherent definition focuses on needs that are an integral part of human beings as subjects, such as needs based on objective interests, subjective preferences, and inner drives. Inherent needs are needs that constitute the characteristics of human beings. The inherent concept of needs is abstract, but its main idea is that needs are essential and part of what shapes the characteristics of human beings. In this aspect, Dean's (2011) concept of inherent needs thus has some consistency with Doyal and Gough's (1991) concepts of universal basic needs (health and autonomy) and even intermediate needs.

Meanwhile, interpreted needs, according to Dean (2011), are based on social processes and hence considered as culturally relative. In this regard, public opinion has a strong influence on determining needs. Dean's (2011) concept of interpreted needs is also relevant to Doyal and Gough's (1991) intermediate needs. Doyal and Gough (1991) believe that intermediate needs are influenced by society. They argue that societal conditions not only influence human needs but also become pre-conditions for the satisfaction of those needs. What will satisfy a need, or a need's satisfier, is influenced not only by civic and political rights and participation but also by the production and distribution of need satisfiers, which vary among societies.

Based on Dean's (2011) taxonomy of inherent and interpreted needs and based on the individualistic versus solidarity perspectives, it can be seen why Dean (2011) concludes that universal needs do exist. Dean (2011) interprets universal needs as being common to all people due merely to social citizenship. However, he argues that, although universal needs are inherent, universal needs can be interpreted in many ways and can occur in many different forms. In contrast, Doyal and Gough (1991), who proposed the concept of universal needs earlier than Dean (2011), use human needs as the basis of their concept of universal

needs. Basic human needs, according to Doyal and Gough (1991), are the same, regardless of citizenship. In short, Doyal and Gough (1991) view universal needs from an absolute perspective.

Comparing the concept of needs as discussed by Doyal and Gough (1991) and Dean (2011), it can be seen that Dean (2011) discusses needs not only in terms of universal needs but also in terms of specific conditions such as circumstantial, particular, and common conditions. The latter concepts are not adequately discussed in Doyal and Gough (1991). Consistent with Townsend's (1979; 1993) concept of relative deprivation, Dean (2011) recognises interpreted needs as both socially constructed and culturally relative and provides additional evidence of the relationship between the concept of human needs and poverty concepts.

Although the concept of human needs is one of the foundations of the concept of poverty, some areas of human needs have rarely been explored in poverty discourses. This is because some elements of human needs are not necessarily relevant in poverty studies. For instance, some needs in Maslow's hierarchy are not necessarily linked to the concept of basic needs in poverty debates. As an illustration, what is the position of needs of love in the poverty discussion? Although the link between some psychological needs and poverty has been contested, the psychological aspect of needs enriches the discussion of human well-being, which is often associated with poverty and deprivation discourses (Gasper, 2004).

The concepts of needs are rarely practical and need to be simplified in poverty studies. Many types of human needs are not easily translated into poverty indicators. Some of those needs are visible, which means that they are clear and easily translated into the concept of poverty, but many others are abstract. Some actions may be required for operationalisation of the concept of human needs in poverty studies. For example, Srinivasan (1977) simplifies basic needs through selecting the visible aspects of needs, such as food and water, and then grouping needs into a simplified set of identified needs called the basket of goods. The basket of goods approach is often used as the basis to identify the minimum standards of living. In addition, Townsend (1979) and Mack and Lansley (1985) have identified a set of necessities and translated it into a set of relative deprivation indicators.

2.1.3 Absolute and Relative Conceptions of Poverty

People can be considered as poor if they fail to meet a certain living standard. That standard thus becomes a threshold to distinguish poor and non-poor. People below the threshold are considered as poor, while people above it are non-poor. The identification of the threshold depends on how poverty is defined and what the reference standards are. If the identification of the reference standard is solely based on theoretical perspectives, an absolute conceptualisation of poverty will result; in contrast, if the identification also considers the situation of the observed population, the result will be a relative conceptualisation of poverty.

Absolute poverty can be defined as the lack of or inability to access the resources needed to meet the most basic human needs. People who cannot meet their needs for food, water, shelter, and warmth are in absolute poverty and experiencing severe deprivation (Gordon, 2006; Sen, 1983; Townsend, 1993). Where human rights are included among these fundamental needs, absolute poverty infringes on human rights.

Absolute poverty relies on subsistence and basic needs as the basis to identify the minimum standards of living. However, basic needs themselves may be relative and vary according to the time and place. Thus, absolute poverty may be unable to address different needs in different locations and at different times. For example, the need for food will vary according to age, gender, and culture. The need for clothing is influenced by weather and culture (Townsend, 1979; 1993).

In response to the critiques about absolute poverty, discussions about relative poverty are increasing. Townsend (Townsend, 1979; 1993) points out that people or households are categorised as poor when their resources (income, consumption, or other attributes) are insufficient to enable them to participate in the society to which they belong. The definition of relative poverty as insufficient resources to participate in society implies that poverty must be understood not only through the limited lens of adequacy of resources for fulfilment of basic needs, but also from a wider view that extends to powerlessness and humiliation (Chambers, 1995), lack of capability to function in society (Sen, 1983; 1985; 1999), social exclusion (Levitas, 2006; Levitas et al., 2007), and lack of socially perceived necessities (Mack and Lansley, 1985). Nevertheless, Sen (1983) does not agree with the criticism of absolute poverty. He argues that basic human

needs are absolute, and that people cannot live without basic necessities, for example, food and water. Furthermore, Sen (1983) explains that absolutism does not mean that basic needs remain the same forever. It means that they will change according to situations and conditions across time.

While there are conceptual debates between absolute and relative concepts of poverty, Sen (1983) and Townsend (1979) recognise that the concept of absolute poverty seems to be more appropriate to lower-income countries. It is a common fact that there are many people in lower-income countries whose basic needs are not met. Applying the concept of relative poverty in an area where the majority of the population is unable to meet even its basic needs will not be as beneficial as understanding the situation in that area in terms of absolute poverty. Measuring absolute poverty in a poor area indicates whether people are meeting the minimum standards of living. When the economy in a lower-income country starts to grow, and the majority of people are meeting the minimum standards of living, the role of relative poverty can increase. In this case, relative poverty is still important even in lower-income countries.

Elements of relative poverty are still present in the absolute poverty concept. When absolute poverty is redefined for specific contexts or specific periods, the definition must address relative aspects of basic needs and acknowledge relative concepts of poverty. Defining local specifics, which is a facet of relative poverty, helps to give an understanding of the meaning of poverty and the basic needs of the people according to the local situation in each area. Referring to the debates between Sen (1983, 1985) and Townsend (1985), basic needs are socially constructed by the society to which people belong. For example, the basic needs of people in a poor area of Indonesia and a poor area of Africa are different. People in both areas need food, but they need different foods. When there is a change of living standards in an area, the understanding of the basic needs in that area will change. Twenty years ago, internet access was not a basic need, but it could be considered a necessity for the current period. Those examples confirm that in practice, the distinction between absolute and relative poverty is not as clear as it has been presented in the literature.

2.2 Childhood, the Needs and Rights of Children, and the Implications for Child Poverty

Children experience poverty differently than adults. Children are more vulnerable to the negative effects of poverty compared to adults because of the developmental and sociological differences between children and adults. From a developmental perspective, children have less physical ability than adults and have distinct needs for their development (Doherty and Hughes, 2009; Feeny and Boyden, 2003). From a social perspective, children are dependent on adults (Main, 2013; UNICEF, 2005). Therefore, a clear understanding of childhood is fundamental for defining child poverty. Furthermore, the measurement of child poverty also needs to take into account the differences between children and adults.

Childhood is a maturation stage for human beings, and it can be understood from a range of perspectives, including biological, cognitive developmental, social, and even legal perspectives. From a biological perspective, the physical transition from childhood to adulthood is an important process in the human life cycle (Doherty and Hughes, 2009). According to Feeny and Boyden (2003), the relationship between childhood and gender is biologically significant as well, whereby puberty can be seen as a critical threshold. From the cognitive-development perspective, the threshold between childhood and adulthood relates to children's psychological development and learning (Ansell, 2005). While there are differences between the biological perspective and the cognitive-development perspective, the two can be clustered conceptually as a child-development approach (Doherty and Hughes, 2009; Feeny and Boyden, 2003). The child-development approach argues that children develop in sequential stages of life, progressing from infancy to toddlerhood, early childhood, later childhood, and finally to adolescence, as the last stage of child development (Doherty and Hughes, 2009).

In contrast, from a social perspective, the definition of children is a product of social systems and cultures. Indeed, the definition of the terms *children* and *childhood* vary across space, time, and cultures (James et al., 1998). The stages of childhood, from a social perspective, do not necessarily follow the sequential stages of child development defined above, which progress mainly according to

physical and cognitive developmental stages. Whiting et al. (1992), for example, expand the social perspective of childhood by describing childhood in terms of social spaces and relations. More specifically, Whiting et al. distinguish the stages of childhood as “lap” or “back children”, “knee children”, “yard children”, and “school” or “community children”. These stages are defined based on the physical ability, spaces, and social relations of children. Moreover, when describing children in a school or community, these childhood stages emphasise on social activities. The social perspective also recognises that children have agency in their own lives and the power to participate in society. These capacities are somewhat overlooked in the stages defined in the child-development approach.

Viewing childhood from a social perspective also involves acknowledging the different social treatment and activities of children and adults. In the context of school, for instance, when children are of a certain age, they are expected to enrol and study in school (GOI, 2003; Mackinnon, 2007). For adults who have already passed the schooling age, there is no expectation to enrol and study in school. However, adults, and especially parents, have different responsibilities, such as the responsibility to send their children to school.

Viewing childhood from the perspective of capability overlaps to some extent with the social perspective of childhood. Capability can be interpreted as the freedom to enjoy valuable functioning. Functioning itself can be defined as the “various things a person may value doing or being” (Sen, 1999). In other words, functioning is the ability of people to be and perform activities that have value such as holding appropriate jobs, consuming adequate nutrition, or being literate (Alkire and Deneleuin, 2010). Freedom, in turn, allows people to have wider opportunities to enjoy functioning (Robeyns, 2005; Sen, 1999). With freedom, people have reason to value and focus on what they are effectively able to do and to be without focusing on utility, for example, on ensuring access to resources such as revenue, assets, or to consume. Ballet et al. (2011) argue that observing children from the perspective of capability means considering children as being endowed with agency and autonomy. Applying the capability perspective to children involves taking into account children’s capacities for self-determination (autonomy of agency) and enjoyment of freedom. Thus, it should be

acknowledged that human capabilities may differ according to age (Biggeri and Mehrotra, 2011).

Although considering children as social actors is extremely important, children may not have the autonomy of agency at the level expected by Doyal and Gough (1991). Doyal and Gough further suggest that the fulfilment of intermediate needs contributes to the optimum autonomy of agency. Nevertheless, from the lens of the development approach (Feeny and Boyden, 2003), some limitations of autonomy of agency may exist. Namely, in the earlier stages of development, children have limited physical, cognitive, and psychological ability to make decisions and carry out actions. However, these limitations are not exclusive to children; such limitations may apply as well, for example, to adults with disabilities or to the elderly. Thus, the question of self-determination or autonomy of agency may be more important in the later stages of childhood as well as for adults. Therefore, in the broader stages of children's life cycles, it is more useful to focus on functioning than on freedom (self-determination) (Ballet et al., 2011).

From a legal viewpoint, the UN Convention on the Rights of the Child (UNCRC) is a sensible reference. The UNCRC, the most comprehensive human-rights treaty to protect children's rights, provides a common understanding as well as moral and legal obligations by state parties to realise children's rights. The four core principles of the UNCRC are non-discrimination (article 2), meaning that the UNCRC applies to all children without exception; respect for the best interests of children (article 3); the rights of children to life, survival, and development (article 6); and respect for children's views (article 12) (UNICEF, 2009b). According to the UNCRC principles, children are recognised as rights' holders rather than objects of charity. The UNCRC provides more clarity as to the rights that can be claimed by children as rights' holders (UNICEF, 2009b). For example, recognising the different position of children in society, the UNCRC states that children are entitled to some specific rights not articulated in the Universal Declaration of Human Rights, for example, the right of children to receive parental guidance (article 5) or the right of children to live with their parents (article 9).

The UNCRC proposes a universal definition of children by using chronological age. It defines children as "every human being below the age of eighteen years unless under the law applicable to the child, majority is attained earlier (UNGA,

1990: Article 1)". Although the choice of 18 years of age is arbitrary, it puts the transition to adulthood beyond the threshold identified in both the biological and cognitive-development perspectives. The key difference between the legal approach to defining childhood and other approaches is that the latter is legally binding.

Therefore, even though chronological age does not reflect the social and cultural meanings of childhood, it is an important way of defining children. So long as child age is registered (see UNCRC article 7), it is a measurable standard that can be used to identify thresholds and stages of childhoods. Individuals within the official age range of children can thereby be afforded special rights as children.

The different meanings of childhood also influence the understanding of children's needs. Applying the concept developed by Maslow (1943), Prince and Howard (2002) explain that physical needs are any necessities essential for the child's survival, such as water, oxygen, food, and other sources of nutrition. They point out that physical needs lie in the lowest level of the hierarchy of needs and should be satisfied before higher levels of needs. Although physical needs are very relevant to understanding poverty, Maslow's concept of human needs expands beyond physical needs to psychological needs such as security, love, and self-esteem (Dean, 2011; Kenrick et al., 2010; Maslow, 1943; Prince and Howard, 2002). According to Prince and Howard (2002), a sense of safety is necessary in order for children to develop properly, which is a real issue for children living in poor neighbourhoods and also conflict zones. A sense of love from parents or caregivers during early childhood means that children are more likely to develop successful relationships with other people in society(Baumrind, 1978; Cochran and Brassard, 1979; Kerns et al., 1996). Self-esteem is important for children to participate in society, and poverty has been shown to hurt children's self-esteem (Batty and Flint; Griggs and Walker, 2008).

The existing concept of needs must consider that particular needs are unique to the distinct stages of childhood. The general concepts of human needs, such as Maslow's (1943) basic needs, Dean's (2011) inherent and interpreted needs, and Doyal and Gough's (1991) intermediate needs, do not distinguish adequately among the needs unique to every stage of human life. When identifying the needs of children, Prince and Howard (2002) also did not adequately differentiate the

needs based on the stages of childhood. The needs of younger children and older children are different. For example, a pre-mobile infant need to be carried and held to support survival, but this is not the case of an older child. Similarly, pre-school children and school-age children also have different needs; for example, young pre-school children under five years old need toys that fit with their age, but school-aged children need books and learning materials that are specific to their grade. Nevertheless, the concepts discussed in the previous paragraphs (Dean, 2011; Doyal and Gough, 1991; Maslow, 1943) do not allow for much differentiation in needs among children in different contexts. Therefore, when translating the concept of needs for identification of the needs of children, there is room to acknowledge various conceptions and stages of childhood.

Considering that children have particular needs, the meaning of poverty for children is not only about limited access to resources. Poverty is a barrier for children to meet their basic rights and fulfil their needs to learn, receive a proper education, access basic services, and participate in society. Poor children have fewer opportunities to go to school. They have limited health care access and are more likely to be impoverished. They are also more likely to live in unhealthy housing without proper sanitation and clean water (Advis and Rico, 2012; Bima and Marlina, 2017; Bima et al., 2017; Gordon et al., 2012; Gordon et al., 2003; Minujin and Delamonica, 2012; Nandy, 2012; Notten et al., 2012; Rizky et al., 2017; Roelen, 2010; Roelen et al., 2012; SMERU, 2011; Yousefzadeh et al., 2012).

Poverty will influence children in the long term. Poverty reduces children's opportunities to function successfully in adulthood. As a result of deprivation during their childhoods, poor children have higher risk to face worse adult outcomes compared to non-poor children (Duncan et al., 1998; Oshio et al., 2009; Ratcliffe and McKernan, 2010), for example, Gregg and Machin (1998) found that poor children have less probability to success in the labour market than non-poor children. Also, children who grow up to be poor adults are more likely to have poor children in the future (Bird, 2007; Moore, 2005). However, the situation of inter-generational poverty, wherein poor adults have poor children, is not necessarily caused by parents. Poor parents do not teach their children to be poor (Gordon, 2018). Instead, inter-generational poverty is an implication of a

structural problem that renders poor parents unable to create better opportunities for their children to escape poverty (Gordon, 2018; Townsend, 1979).

2.3 Approaches for Defining and Measuring Child Poverty

There is no universal standard definition of child poverty. Child poverty can be defined based on monetary resources perspectives, deprivation perspectives, capability perspectives, and even from the lens of social exclusion. Even the UNCRC, a global standard of child rights, avoids use of the term *child poverty* altogether, declining to identify the term's meaning or definition (Pemberton et al., 2012).

Different understandings of child poverty lead to different definitions of who poor children are and influence how child poverty is measured. As discussed previously, the basic concepts of poverty are absolute and relative poverty. Absolute poverty can be defined as the lack of resources necessary to meet the most basic human needs (Gordon, 2006; Sen, 1983; Townsend, 1993). From the viewpoint of relative poverty, echoing Townsend (Townsend, 1979; 1993), people can be seen as poor when their resources are insufficient to enable them to participate in the society to which they belong. Both relative and absolute poverty are used as boundaries to select the concepts and measures of child poverty.

This thesis recognises two major approaches to defining and measuring child poverty: the monetary approach, which focuses on adequacy of resources, and the multidimensional approach, which focuses mainly on non-monetary indicators. While section 2.3.1 overviews the relationships between child poverty and human rights, discussion of the definition and measures from the monetary and multidimensional approaches can be found in sections 2.3.2 and 2.3.3 respectively.

2.3.1 Child Poverty and Human Rights

In the context of the human rights of children, the 1990 United Nations Convention on the Rights of the Child (UNCRC) raised the expectation that the rights of children should be recognised and protected worldwide. With the greater attention on child rights that has followed the publication and ratification of the UNCRC, child poverty has been increasingly discussed and highlighted among

scholars, practitioners, politicians, and policymakers. The existence of child poverty is evidence of countries' failure to provide universal fulfilment of child rights. The UNCRC mandates that there must be policy and intervention to protect all children and improve child well-being (Delamonica et al., 2006; Espey et al., 2010; Jones and Sumner, 2011).

However, Mestrum (2015) argues that the statement of the right to an 'adequate standard of living' in the UNCRC is a strong indication of the UNCRC's recognition of the many issues inherent in child poverty. This argument should be strongly considered because the meaning of children's right to an 'adequate standard of living' is in line with children's right to be non-poor, even though child poverty may have a more comprehensive meaning compared to provision of an adequate standard of living.

The exclusion of the term *child poverty* in the UNCRC seems to influence the way child poverty is defined at a country level. Although almost all countries in the world have ratified the UNCRC, only a few developing countries distinguish poverty and child poverty in their policies.

However, exclusion of the term *child poverty* does not mean that the UNCRC is unusable in the context of child poverty. The UNCRC is indirectly helping to integrate child poverty into the child rights framework and increasing the pressure on states to deal with child poverty (Pemberton et al., 2012; Pemberton et al., 2007). Additionally, the UNCRC outlines the rights of children and the well-being dimensions, which may provide some guidance for defining child poverty and deprivation (Morrow and Peels, 2012; Pemberton et al., 2012).

Since human rights also involve discussion of human agency and structure, the concepts of human agency and structure are helpful in analysing child poverty. Moser (2005) explains that human agency is the ability of agents to act independently. Structure is the system that forms the boundaries of individual freedom. According to Moser (2005), there are two main agents in the human rights-based approach that can be applied to analyse child poverty: duty bearers and rights' holders. Duty bearers are agents who have obligations to realise human rights. Therefore, it should be assumed that governments, as the main duty bearers, are the actors primarily responsible for ensuring respect, promotion, and fulfilment of human rights. The rights' holders, in turn, are the agents who are

entitled to claim their rights. The concept of human agency helps to explain how children can act independently, how other actors act, what the implication of actions are, and how the system limits actions.

In the context of child poverty, the discussion of duty bearers and rights holders is complicated but worth exploring. Considering children as rights holders, various duty bearers are accountable for the fulfilment of child rights. Although the UNCRC clearly mentions the obligation of ratifying countries to fulfil child rights, in reality, parents, communities, and local institutions seem to be the 'real' duty bearers, especially in countries with an immature welfare system where the government is only able to provide minimum support in the fulfilment of child rights. It can be concluded that integrating child rights into child poverty discourse would help to enrich the discussion of the concept of child poverty, for example, by clarifying the rights that should be claimed by the rights holders. Furthermore, the interaction of states, communities and parents, as duty bearers, with children, as rights holders, would help to explain the nature of child poverty, for example, by explaining what acts or omissions of duty bearers are causes of poverty among children.

2.3.2 Child Poverty from a Monetary Perspective

2.3.2.1 Defining Monetary Child Poverty

The concept of monetary child poverty focuses on the adequacy of monetary resources. This concept assumes that poor children reside in households that lack adequate monetary resources to meet the minimum living standards, to access the necessary goods and services (Coudouel et al., 2002; Haughton and Khandker, 2009), or to participate in the society to which the households belong (Townsend, 1979; 1993).

How people use their resources is related to their capabilities. The capability approach considers income to be a relevant factor in influencing human functioning, but income may also be used as a proxy for freedom, with more income leading to more choices and opportunities (Biggeri and Mehrotra, 2011). However, income is just one of many input factors, and many other factors, including commodities such as assets, location, and government policy, are also important. People may require different combinations of factors, for example, more assets but lower income, or vice versa, to enjoy similar levels of capability.

A lack of monetary resources does not always translate into low standards of living and vice versa. Donnison (1988) and Ringen (1987; 1988) argue that resources represent the indirect concept of poverty. While more resources can lead to higher living standards, there is no guarantee that those people with more resources will have higher living standards because people use their resources differently. Furthermore, while children have different needs than adults, children do not necessarily spend monetary resources themselves, and to a large extent, parents have the power in allocating resources to children, based on parents' reasoning of the needs of their children, not on children's reasoning. Thus, while children in different stages of life have different needs and participate in society in different ways, resources allocation may not necessarily reflect those differences.

Therefore, it is important to pay attention to intra-household decision-making and allocation of resources. It cannot be assumed that each household member is getting an equal share of resources. When households experience a lack of resources, not all household members necessarily suffer due to the lack resources (Cockburn et al., 2009). For example, poor parents may make sacrifices to fulfil the needs of their children. This means that children from income-poor households may not necessarily be poor or suffer from low standards of living.

The indirect concept of poverty often neglects availability of public goods (Kjelsrud and Somanothan, 2013), common property resources, and state-provided commodities (Baulch, 1996). The state-provided commodities and public goods in poorer countries may be less available than in richer countries. The common resources of property may be distributed unequally among regions. Even within a population having the same level of income, differences in the common resources of property and state-provided commodities contribute to the differences in living standards. As illustrations, even if basic education is compulsory and parents can afford the school fee (Woodhead, 2012) or do not need to pay a tuition fee at all (Molet, 2007), children in a remote village may still be unable to attend school as a result of the lack of a school in the area. Additionally, children in remote areas may be unable to gain access to health facilities or support from health workers despite their families being able to afford

such services (Effendi, 2008). Children who are technically non-poor can even die from starvation if there is no food supply in their area (BBC News Asia, 2018). Under these circumstances, poverty may not necessarily be equated with a lack of monetary resources.

2.3.2.2 Measuring Monetary Child Poverty

Many of the aforementioned studies mention income as the only monetary measure. However, monetary poverty can be measured either by income or by using a proxy for income based on a calculation of goods and services consumed or enjoyed by individuals or households (Deaton and Zaidi, 2002; Haughton and Khandker, 2009; Thorbecke, 2007). When access to goods and services is unequal, the same level of income does not generate equal access to goods and services. Income is thus less useful when goods and services are unavailable or limited. Some goods and services may be easily accessed by some communities but not by others. In these cases, the access to goods and services becomes more important than income as a poverty measurement indicator. Similarly, when there are disparities in the availability of public services or the supply of goods and services, income measures will be less meaningful than consumption-related measures (Deaton and Zaidi, 2002; Gordon and Nandy, 2012). Additionally, Coudouel et al. (2002) and Ringen (1988) point out that income only represents resources and may not always be translated into consumption. Furthermore, in rural areas, income data may not provide accurate information about poor agricultural families because these families may not sell their agriculture products for income, but rather may consume the products themselves or exchange them for other products (Deaton and Zaidi, 2002). Therefore, in such cases, referring to Coudouel et al. (2002), Deaton and Zaidi (2002), and Ringen (1988), consumption, reflected by expenditure, will be a better indicator of poverty than income because actual consumption is more closely related to individual well-being, for example, having enough consumption to meet the current basic needs.

From theoretical perspectives, Deaton and Zaidi (2002) acknowledge that while it is possible to identify the particular resources of any individual, it is more complicated to identify or assign the consumption or expenditure of an individual. However, some scholars (Deaton and Zaidi, 2002; Haughton and Khandker, 2009; Ringen, 1988) have argued that individual consumption has more of a

direct relation to individual welfare than income because consumption has a closer relationship to living standard and quality of life. Those scholars (Deaton and Zaidi, 2002; Haughton and Khandker, 2009) have also argued that it is difficult to link individual income to individual welfare directly because income may also be consumed by another family member. Practically, Haughton and Khandker (2009) highlighted that income is frequently understated because people are often reluctant to disclose their income, especially irregular earnings. Furthermore, Deaton and Zaidi (2002) noted that it is more difficult to obtain income data for self-employed individuals than to obtain consumption data. The self-employed do not obtain income in the form of a salary or wage, and it is difficult to separate business and individual transactions, especially in the context of small employers in Indonesia, where financial literacy is still low (Cole et al., 2009).

Monetary poverty is defined based on a set of monetary thresholds, called the poverty threshold, to distinguish between the poor and the non-poor. The selection of poverty thresholds is influenced by the absolute and relative poverty discourse. Absolute poor children come from families who are unable to earn adequate income or consume adequately to meet the minimum standards of living (Coudouel et al., 2002; Haughton and Khandker, 2009; Laderchi, 2000; Ravallion, 1992). There are problems with the identification of poverty thresholds from an absolute viewpoint. For example, the World Bank poverty threshold, one of the most widely used absolute poverty thresholds in developing countries, was considered too low (Pritchett, 2003) and to have several methodological problems such as variations in consumption and income indicators, seasonality, adjustment of different prices; variations in frequency; timeliness issues in how the surveys are applied across countries (Chandy, 2013); and weaknesses due to not having been specifically designed to measure child poverty (Gordon and Nandy, 2012).

In contrast to absolute poverty, relative poverty is based on possession of the monetary resources required to participate in society. Poor children, according to the relative poverty definition, are children of households that are unable to maintain the amount of income or consumption necessary to allow full participation in the society to which the household belongs (Coudouel et al., 2002;

Laderchi, 2000; Townsend, 1979). In practice, the common thresholds to identify the poor and non-poor are mean and median households' income or consumption (Rio Group, 2006; Townsend, 1979). Additionally, the relative threshold of monetary poverty can be defined subjectively based on indirect consensual methods that rely on public consensus (Goedhart et al., 1977; van Praag et al., 1980; van Praag et al., 1982; Veit-Wilson, 1987).

While relative monetary poverty highlights the positions of the individual or household compared to the positions of others in a given society, it may provide misleading information when compared across different countries. As an illustration, rich countries may have more relatively poor people compared to lower-income countries (Nastic, 2012). However, the relative monetary poverty measurement is still important, especially in the context of middle-income and rich countries, where absolute poverty has been significantly reduced or almost eradicated.

Another important issue concerning monetary poverty measurement is the variation in household consumption patterns. This issue is very important to child poverty measurement because children have different needs and consumption patterns compared to adults. Household consumption is associated with household size as well as with the age and gender of household members. There are different approaches to monetary poverty measurements dealing with a variety of household sizes, ages, and genders, such as the per capita approach, child cost, and equivalence scale (Cockburn et al., 2009; Gray, 2013; White and Masset, 2002). Comparisons between these approaches can be seen in Appendix A (Table A-1).

Per capita approach measurements are used widely; however, they do not recognise variations in household size, age, and gender. To deal with this weakness, the child-cost and equivalence-scale approaches were developed. Echoing White and Masset (2002) and Gray (2013), combining child cost and adult equivalence scales is one of the best approaches to measuring child poverty from a monetary perspective because the equivalence scales help to deal with the non-public goods involved in the cost of children's needs. However, as highlighted by White and Masset (2002), the available data may not provide

detailed information about child costs, and it is very difficult to find an appropriate equivalence scale for measuring child poverty.

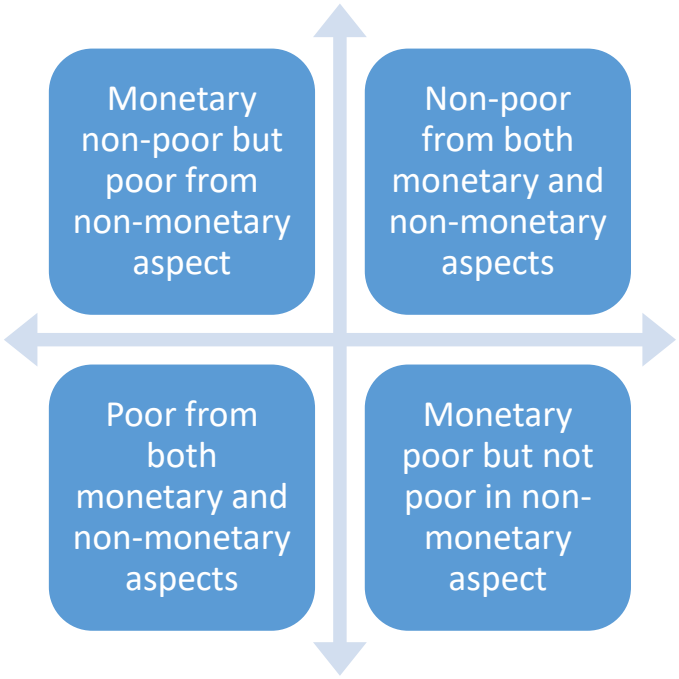
2.3.3 **Child Poverty from a Multidimensional Perspective**

2.3.3.1 Conceptualising Multidimensional Child Poverty

Many scholars agree on the multidimensionality of child poverty. Child poverty covers many dimensions and is not necessarily about lack of income (Alkire and Roche, 2012; Barnes and Wright, 2012; Gordon et al., 2012; Gordon and Nandy, 2012; Gordon et al., 2003; Minujin and Delamonica, 2012; Nandy, 2012; Nandy and Pomati, 2015; Notten et al., 2012; Pemberton et al., 2012; Pemberton et al., 2007; Yousefzadeh et al., 2012). However, Mestrum (2015) criticises the multidimensional child poverty measures as a blurring of the concepts of the causes, manifestations, and consequences of poverty. While Mestrum (2015) critique seems to be valid, in fact, the very differences in terminology and concepts that he highlights are confirmation that various arguments surround the contested definition of child poverty. What Mestrum (2015) refers to as 'poverty' is typically called monetary poverty or income poverty. What Mestrum (2015) refers to as the consequences of poverty are actually a representation of various multidimensional poverty concepts, for example, relative deprivation, capability, and functioning.

To deal with different terminologies and contribute effectively to the debate, it needs to be understood that multidimensional child poverty covers monetary and non-monetary aspects of child poverty. There is a multidimensional relationship between monetary and non-monetary poverty as illustrated in *Figure 2-1*.

Figure 2-1. Relationship between Monetary and Non-Monetary Child Poverty Measures



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Source: Gordon and Nandy (2012)

Figure 2-1 confirms that although poverty is multidimensional, children are not necessarily poor in all dimensions. Children can be poor only according to monetary poverty, only according to non-monetary poverty, or according to both monetary and non-monetary poverty. The overlap between monetary and non-monetary aspects represents those who experience monetary and non-monetary poverty simultaneously. Children who are poor from both monetary and non-monetary aspects face a serious problem. Their poverty is more likely to become chronic. Without external support, they stand a very low chance of moving out of poverty.

The illustration in *Figure 2-1* supports the argument that non-monetary poverty is a consequence of monetary poverty. Monetary poverty without the non-monetary aspect also indicates the vulnerability of being non-monetarily poor. According to Gordon and Nandy (2012), children who are currently monetarily poor but not poor in non-monetary terms are vulnerable to becoming non-monetarily poor if monetary poverty continues. On the other hand, being monetarily non-poor is also an opportunity to move out of non-monetary poverty. Children from families

that have adequate incomes (not poor from monetary perspectives), yet are poor from non-monetary aspects, will have a higher chance of moving out of non-monetary poverty if they continue to be non-poor from a monetary poverty perspective. The example of operationalisation of multidimensional approach can be seen in Appendix A (Table A-2).

The concept of child poverty in the multidimensional approach focuses mainly on deprivation and assumes that poor children lack the essential necessities. The basic concept of deprivation is the interpretation of needs in poverty discourses. The idea of deprivation applies to condition (such as physical condition, social achievement, or circumstances), which is mainly non-monetary, rather than resource based (Townsend, 1987). Non-monetary child poverty will cover various dimensions, for example, violation of various domains of child rights or lack of various necessities. However, deprivation also sometimes takes into consideration the context of resources, for example, monetary or financial deprivation. Children are classified as "deprived" if they are going without an essential item or as facing multiple deprivations if they are experiencing poverty simultaneously (Gordon and Nandy, 2012; Gordon et al., 2003).

Children can experience deprivation in absolute terms, namely absolute deprivation, or relative terms, namely relative deprivation, both of which also entail discussion of many different concepts. Children are in the condition of absolute deprivation when they are unable to meet their basic needs. The basic needs of children in the context of absolute deprivation are defined according to objective minimum standards that are universally applicable to all children (Gordon et al., 2003; Pemberton et al., 2012), for example, physical needs (Kenrick et al., 2010; Maslow, 1943; Srinivasan, 1977), psychological needs (Kenrick et al., 2010; Maslow, 1943), and more specific universal core needs such as health and autonomy (Doyal and Gough, 1991). The basic needs can also be defined based on human-rights standards such as the UNCRC, which outlines the minimum standards for the treatment, care, survival, development, protection, and participation of children (Pemberton et al., 2012; UNICEF, 2009b). The UNCRC also provides insights into the relationship between children and poverty. Although it does not define child poverty or specific rights related to child poverty and does not use the term *child poverty*, applying the human-rights approach is

considered relevant to defining poverty in that the human-rights approach defines children's rights, as well as the domains of children's well-being (Morrow and Peels, 2012; Pemberton et al., 2012). The capability approach offers another interpretation of absolute deprivation. According to the capability approach, child poverty can be interpreted as children's inability to enjoy valuable functioning, or the lack of substantial freedom to enjoy functioning (Biggeri and Mehrotra, 2011).

While absolute deprivation assumes basic needs are universal to all human beings, the assumption is contested. The basic needs concept incorporates not only maintaining physical condition per the subsistence concept but also meeting minimum necessities of life, which are strongly influenced by the society. Therefore, basic needs and their satisfiers may be relative and vary according to time and place (Dean, 2011; Townsend, 1979; 1993). For example, although two centuries ago electricity was not a basic need, today electricity is considered a basic need, especially in wealthy societies. In the UK, having a cup of tea is also considered a basic need, according to local custom. Rice can be considered as a necessity in some countries in Asia, but not in the UK. Thus, absolute deprivation may fail to reflect that different needs exist in different locations and at different times. Differences in space and time, such as differing cultures, have implications for the needs in a given locality, and those implications are not adequately addressed in the concept of absolute deprivation (Townsend, 1979; 1993).

In contrast to absolute deprivation, relative deprivation means lacking the essential necessities to participate in the society to which one belongs. Relative deprivation refers to observable and demonstrable disadvantages that an individual, family, or group faces in comparison with the wider group (such as the local community or wider society) to which the individual, family, or group belongs (Townsend, 1979; 1993). In more detail, relative deprivation can be defined as follows:

> Deprivation takes many different forms in every known society. People can be said to be deprived if they lack the type of diet, clothing, housing, household facilities and fuel and environmental, educational, working and social condition, activities and facilities which are customary, or at least widely encouraged and approved in the societies to which they are belong (Townsend, 1987: 125-126).

Echoing Townsend (Townsend, 1979; 1993), it can be said that children face relative deprivation if they are unable to meet one or some essential necessities. Relative deprivation can happen when people facing relative poverty also have fewer financial resources than other people in society.

In the concept of relative deprivation, needs are socially constructed. It is a reflection of the situation and way of life in society. Children in developing countries such as Ethiopia (Roelen and Camfield, 2013), Benin (Nandy and Pomati, 2015), and Vietnam (Harpham et al., 2005) express very basic needs such food, medical treatment, school uniforms, etc. as their necessities. On the other hand, children in wealthy countries such as the UK have broader needs which are not necessarily basic needs (Main, 2013). Those studies indicate that in developing countries, absolute and relative deprivation are converging in terms of the needs involved (Harpham et al., 2005; Nandy and Pomati, 2015; Roelen and Camfield, 2013); however, in wealthy countries like the UK, relative deprivation goes beyond the core needs, and its convergence with absolute deprivation is weaker (Main, 2013). Therefore, children can experience relative and absolute deprivation at the same time, namely when children experiencing relative deprivation also cannot meet their core needs. Children can also experience relative deprivation without experiencing absolute deprivation, namely when they can meet their core needs but cannot access one or more of the essential necessities that are considered as norms in their society.

Referring to Townsend, relative deprivation can be further distinguished into “material” and “social” deprivation. Material deprivation can be defined as an inability to achieve the minimum acceptable way of life in the society to which the person belongs because of inadequate resources (financial or otherwise). It represents the direct measurement of poverty as reflected in the inability to meet essential needs and poor living standards compared to other people in the society (Townsend, 1979; 1993).

In comparison, social deprivation can be defined as the inability to fulfil social needs through having interpersonal contact and being involved in social activities. Social needs may vary among cultures or regions (Townsend, 1979; 1993). Children can have interpersonal problems with their parents, other family members, teachers, peers, and other people in their society (Ridge, 2002).

Children's exclusion from social activities can be defined in many ways, such as exclusion from education, health care, or social security.

In addition to absolute deprivation and relative deprivation, there are other concepts that seem appropriate to measuring child poverty from multidimensional and mainly non-monetary perspectives, such as social exclusion, well-being, and the capability approach.

Social exclusion is a broad concept It is not just social deprivation (Levitas, 2006) but also exclusion from welfare-state services and social security (Saith, 2001). Social exclusion also often involves material deprivation (De Haan, 2000; Levitas, 2006). In some cases, social exclusion is also considered as a multidimensional process that causes deprivation (De Haan, 2000). Therefore, it can be argued that multidimensionality is the main feature of social exclusion (Levitas, 2006; Levitas et al., 2007). When an individual faces multiple exclusions at the same time, the situation is categorised as deep exclusion (Levitas, 2006; Levitas et al., 2007). More specific to child poverty, Wordsworth et al. (2005) distinguish four main types of exclusion faced by children. The first is the stigma attached to social status. Social status is critical to a child's sense of well-being and is more likely to become a sensitive issue for poor children because of the pressure on them to be "normal" and not "different" from their peers. The second type of exclusion is related to group membership. In this context, social isolation is not a random experience but a consequence of who the children are; it is related, for example, to their caste, race, ethnicity, or religion, and it has more serious effects on poor children. The third type of exclusion is related to economic status: poverty may push children to work in hazardous situations and will increase the risk of children being excluded based on racial, ethnic, religious, or caste discrimination. The fourth type of exclusion is related to cultural bias, since culture may lead to exclusion of some groups of children, for example, exclusion of girls from education in some lower-income countries. These types of exclusion clearly indicate that social exclusion is closely related to the issue of participation in society. These types of exclusion also indicate that exclusion is not necessarily a consequence of a lack of resources; exclusion can also be due to a structural problem that is limiting children's agency to participate in society. While social exclusion indicates deprivation, it is beyond the boundaries of child poverty as

defined in this thesis. Social exclusion is not necessarily considered as a consequence of lack of resources. Therefore, it will not be applied further in this thesis.

The concept of child well-being is extremely broad and goes beyond material and social well-being. The notion of well-being assigns great importance to the 'relational' aspect of human beings, which is also one of the main concerns of social inclusion (and also social exclusion) and of the 'subjective' concepts (Bradshaw et al., 2007; Sumner, 2010). Well-being also concerns 'agency' and 'power' (Sumner, 2010). From this perspective, it must be recognised that the concept of well-being has some overlaps and relationships with the capability approach, and since the capability approach allows various interpretations, well-being can be used as one of the ways to translate the capability approach into a more practical method in the context of child poverty discourse (Di Tommaso, 2007; Trani et al., 2013). The discussion of subjectivity and agency is also beyond the boundary of the definition of poverty in this thesis. Poor well-being is also not necessarily a consequence of lack of resources.

The concept of capability is also promising. It recognises freedom and agency as necessary to functioning. Ballet et al. (2011) argue that observing children from the capability approach lens means viewing children as actors endowed with agency and autonomy. The capability enjoyed during childhood will influence the capability during adulthood. Applying the capability approach to children requires an understanding that children have the capacity for self-determination and for enjoyment of their freedom, even though that capacity may differ among children based on their ages. However, it is more important to focus on functioning than on freedom (self-determination). Additionally, the question of self-determination or agency may be more important at certain stages of childhood rather than throughout childhood. While considering children as agents, it is worth considering that the possibility to transform capability of children into functioning also influenced by parent or teacher. When considering child poverty from capability approach, child poverty can be interpreted as capability deprivation and lack of achieved functioning among children (Biggeri and Mehrotra, 2011). According to Biggeri and Mehrotra (2011), the capability approach considers income as a relevant factor that influences functioning, and income can also be

used as a proxy for freedom. However, other factors are also important, because different children may require different approaches to enjoy similar levels of capabilities. In this context, the capability approach argument is not too different to Ringen's (1987; 1988) argument that income, as a resource, will indirectly influence living standards. However, capability is abstract, and there is no agreed upon standard on how to translate capability into a practical measurement.

In practical terms, the interpretation of capability approach to measure child poverty (Biggeri and Mehrotra, 2011; Trani et al., 2013) is also inconsistent with the concept of capability approach, which focuses on agency and freedom. Additionally, related to the discussion in section 2.2, younger children may have limited agency, which also violates the basic concept of the capability approach. In fact, the identification of capability approach indicators to measuring child poverty are also based on the UNCRC (Biggeri and Mehrotra, 2011; Trani et al., 2013), in a similar way to absolute deprivation (De Neubourg et al., 2014; De Neubourg et al., 2012a; b; Gordon et al., 2012; Gordon and Nandy, 2012; Gordon et al., 2003).

2.3.3.2 Measuring Multidimensional Child Poverty from Absolute and Relative Deprivation Perspectives

Based on the considerations above, this thesis does not use the concepts of social exclusion or well-being or the capability. Rather, this thesis focuses on absolute deprivation and relative deprivation. The comparisons between absolute deprivation and relative deprivation can be seen in Table 2-1.

Table 2-1. A comparison of methods for measuring multi-dimensional poverty from absolute and relative deprivation perspectives

	Absolute deprivation	**Relative deprivation**
Identification domains, indicators, and thresholds	Normatively identified based on one or more of the items below: • Basic needs • Human rights	Needs are conceptualised as based on the society to which the individual belongs as a reference. The domains, indicators, and thresholds can be defined based on the following methods: • Socially perceived necessities • Proportional approach • Normative approach
Strengths	• Seems to be comparable, especially in the context of subsistence.	• Able to capture the essential necessities more effectively.
Major weaknesses	• Problems with identification. Needs may vary in different societies and at different times. Some essential necessities may be excluded. Operationalisation of capability is also unclear. • Threshold seems to be low for rich countries.	• Relative deprivation is society-specific. • It is difficult to compare different societies.

One widely used method for measuring absolute deprivation among children, often called the Bristol Method, is based on children's rights (Gordon et al., 2003; Pemberton et al., 2012). It was expanded in Multiple Overlapping Deprivation Analysis (MODA) by UNICEF (De Neubourg et al., 2014; De Neubourg et al., 2012a; b). The Bristol Method objectively identifies the relationship between the rights contained in the UNCRC and the severe deprivation indicators that represent the UNCRC articles in health, standards of living, education, and information. Domains of Bristol methods can be seen in Appendix A (Table *A-2*).

Pemberton et al. (2012) argue that the indicators of the Bristol Method may not match the UNCRC in a perfect sense but may be useful in a practical sense. One of the key strengths is consideration of the fact that children are different to adults and have special needs for protection, survival, and development (Delamonica et al., 2006). The Bristol Method successfully aligns child poverty measurements and the UNCRC (Alkire and Roche, 2012; Gordon and Nandy, 2012).

Additionally, because it fits the Multiple Indicators Cluster Surveys (MICS) and the Demographic and Health Surveys (DHS), the Bristol Method is very suitable for monitoring the fulfilment of children's rights and can be replicated in many countries (Alkire and Roche, 2012). On the other hand, the Bristol Method pays too much attention to material deprivation at the expense of social and psychological deprivation. However, this imbalanced focus may be due to the lack of available data – a common problem for child poverty studies in developing countries (Jones and Sumner, 2011).

There are two possible ways to measure relative deprivation. The first uses the methods developed by Townsend (1979), and the second uses the methods initially developed by Mack and Lansley (1985). In his pioneering research, Townsend (1979) developed an index to measure poverty based on relative deprivation. However, while Townsend's (1979) definition of relative deprivation is widely accepted, the index has attracted some criticism. The main criticisms highlight its arbitrariness in a selection of relative deprivation indicators and its inability to tackle the issues of individual preferences (Mack and Lansley, 1985). Mack and Lansley (1985) seek to tackle these issues by selecting deprivation indicators based on social perceptions of necessities. Mack and Lansley (1985) consensual method and versions of this method have been widely applied in measuring poverty (Fahmy et al., 2015; Halleröd, 1994; 1995; Halleröd et al., 2006; Nandy and Pomati, 2015) and also child poverty (Barnes and Wright, 2012; Main, 2013; Main and Bradshaw, 2014). Using this method, deprivation in the context of child poverty means children's lack of socially perceived necessities that are important for their survival and development (Main, 2013; Main and Bradshaw, 2014). This method takes into account subjective views in measuring child poverty – not just the adult's views, but also the views of the children. However, the practicability of the socially perceived necessities approach is limited. Data on perceived necessities are not widely available, and alternative ways of measuring relative deprivation are limited.

Some studies (Desai and Shah, 1988; Fahmy et al., 2007) have offered alternative solutions to dealing with some of the arbitrariness of the selection of relative indicators; these alternatives allow a robust measure of relative deprivation without socially perceived necessities data. The methods assume

that if the majority of the population in the society have access to particular goods and services, those goods and services are essential necessities in that society. Based on this assumption, the indicators are selected according to the possessions of the majority of the population in that society. Unfortunately, none of these approaches (Desai and Shah, 1988; Fahmy et al., 2007; Townsend, 1979) have been designed and tested to measure relative deprivation among children.

2.4 Measuring Child Poverty in the Context of Developing Countries

Child poverty is measured in both economically developed and developing parts of the world. However, not all countries measure child poverty. According to UNICEF's global mapping of child poverty measures (UNICEF and Global Coalition against Child Poverty, 2017), 65 of the 160 countries that participate in mapping have not measured child poverty. Nevertheless, since the mapping is conducted in the majority of the countries in the world, that result still means that child poverty is measured in two thirds of the countries in the world.

The mapping has confirmed that there is no single way to measure child poverty. Almost half of the countries that measure child poverty use both monetary and multidimensional approaches (46%). Almost one fifth (19%) of the countries measuring child poverty exclusively use the multidimensional approach. About 35% of the countries exclusively use the monetary approach (UNICEF and Global Coalition against Child Poverty, 2017).

Child poverty is measured differently in developing (poor and middle income) countries than in rich countries. In rich countries, relative deprivation and social exclusion are widely accepted for analysing and measuring child poverty (Kim and Nandy, 2018; Levitas et al., 2007; Main and Bradshaw, 2014; Oroyemi et al., 2009; Ridge, 2002; Tomlinson et al., 2014). In developing countries, child poverty is commonly measured based on absolute deprivation from either the human-rights or basic-needs perspective (Gordon et al., 2012; Gordon and Nandy, 2016; ISAE and UNICEF, 2009; Minujin et al., 2011; Minujin and Delamonica, 2012; Nandy, 2012; Notten et al., 2012; Qi and Wu, 2014; REPOA and UNICEF, 2009; Roelen, 2010; Roelen and Gassman, 2008; SMERU, 2011; UNICEF, 2009a;

Yousefzadeh et al., 2012). In some cases, child poverty in developing countries is also measured based on the capability approach (Di Tommaso, 2007; Trani et al., 2013).

The majority of relative deprivation studies have focused on European contexts (Guio et al., 2012; 2018; 2017; 2016). However, some country-specific studies in the context of developing countries do exist. Barnes and Wright (2012), for example, analyse child poverty using socially perceived necessities in South Africa. They employ indicators that have some similarity to the ones used by a similar study in the UK (Main, 2013). The similarity of indicators is interesting because, despite being conducted in different contexts, namely the UK (Main, 2013) and South Africa (Barnes and Wright, 2012), both studies use qualitative methods to identify indicators before doing further analysis. This means that there are many overlaps about what those studies define as socially perceived necessities and, hence, that these necessities do not necessarily cover the basic needs. The similarity is sensible because although South Africa is a developing country, it is one of the most developed countries in Africa and has a high living standard. Indeed, the list of indicators in Barnes and Wright's (2012) study differs slightly when compared to the list of a study measuring socially perceived necessities in Benin (Nandy and Pomati, 2015), a very poor country in Africa. In Benin, almost all of the indicators which people reported as important necessities are basic needs indicators such as water access, housing etc (Nandy and Pomati, 2015). These indicators are similar to the indicators of absolute deprivation. This finding indicates that absolute deprivation is a very relevant child poverty measure for poor countries.

Meanwhile, studies based on absolute deprivation in developing countries are available in many geographic levels. Some cross-country studies exist as well. These studies have been conducted in various continents such as at the global level (Gordon et al., 2003) and in Sub-Saharan Africa (Nandy, 2012), Latin America (Advis and Rico, 2012), and East Asia and the Pacific (Minujin et al., 2011). Using the same methods, Nandy (2012) analyses child poverty in Sub-Saharan Africa to observe the changes in child poverty. Many studies have also been conducted at the country level (Gordon et al., 2012; Gordon and Nandy, 2016; ISAE and UNICEF, 2009; Minujin and Delamonica, 2012; Notten et al.,

2012; Qi and Wu, 2014; REPOA and UNICEF, 2009; Roelen, 2010; Roelen and Gassman, 2008; SMERU, 2011; UNICEF, 2009a; Yousefzadeh et al., 2012).

Considering the differences between monetary and multidimensional measures, an effort to analyse both measures has been initiated in developing countries. UNICEF developed Multiple Overlapping Deprivation Analysis (MODA), which allows for the combination of monetary and multidimensional child poverty measures. The multidimensional indicators of MODA have been developed based on the UNCRC, with some options to add monetary indicators. The majority of the indicators of MODA are similar to the Bristol Method for child poverty, with some additional domains related to child rights such as freedom from violence. MODA is also valuable because it combines poverty measurement methods that are used by Alkire and Foster's multidimensional poverty index (MPI) and takes the different stages of childhood into consideration (De Neubourg et al., 2014; De Neubourg et al., 2012a; b). Moreover, MODA is not only focused on comparing different domains; it also considers the overlap between different domains, which further adds to its value (De Neubourg et al., 2012a; b). Nevertheless, the key benefits of MODA are that it allows for simple measures that can respond to the availability of data; provides better opportunities to identify child poverty indicators that fit with the local context within the human rights framework; and adds local specific measurement methods to provide more useful information based on the needs within the country (Chzhen et al., 2017; De Neubourg et al., 2012b).

Another example is a study conducted by Roelen (2010), who tries to develop a child poverty measurement that combines monetary and non-monetary analysis to measure child poverty in Vietnam. While the indicators identified are based on her conceptual knowledge (expert based), her measurement takes into account the local context in Vietnam by recognising development priorities in the contexts of child poverty and also the data availability.

Considering that monetary and non-monetary approaches measure different dimensions of well-being, a more radical effort to combine monetary and non-monetary measures has been made. This combination of the measures goes beyond the comparison or analysis of the overlap between indicators by aggregating monetary and non-monetary measures into a composite index. The

MODA approach, in its guidelines, also suggests this strategy, despite the strategy's dependence on data availability (De Neubourg et al., 2012b). The relative deprivation index that was developed through consensual methods also often combines monetary and non-monetary measures. Halleröd (1995) tries to integrate local specific non-monetary necessities that have been identified via consensual methods with socially perceived minimum income, which is part of monetary consensual methods, to measure poverty in Sweden. A similar attempt is conducted by Nolan and Whelan (1996), who also try to integrate local specific non-monetary necessities that have been generated via consensual methods with socially perceived minimum income to measure child poverty in Ireland.

2.5 Conclusion

This chapter concluded that poverty is a multidimensional concept that can be seen from various perspectives. However, the chapter also confirmed that in general, poverty can be defined as a lack of resources, whether of the resources required to enable people to meet the minimum standards of living per the definition of absolute poverty or of the resources needed to participate in the society to which they belong per the definition of relative poverty.

The chapter highlighted that human needs and human rights are fundamental elements of poverty concepts. There are some relative elements of human needs. Human needs may vary according to place, time, and culture. However, in the contexts of subsistence and very basic needs, human needs can be considered as absolute. The different conceptions of human needs, in particular whether those needs are absolute or relative, have elicited a new discussion about absolute and relative poverty.

There is no single definition of children. Children have been defined in terms of life cycle, legal standing, and social context. To operationalise the concepts of children in poverty measures, those concepts need to be translated into an age standard. While age seems arbitrary, it is necessary to have a certain level threshold of age.

The idea of resources forms the conceptual background behind monetary child poverty measures. Being resource-poor is often interpreted as being income

poor. However, it is better interpreted as being monetarily poor. Resources are not always in the form of income; they are sometimes in the form of assets, savings, and other types of financial resources. According to the concept of resources, poor children are those living in monetarily poor households or having monetarily poor parents. Parents are considered as monetarily poor when they lack the financial resources to fulfil their children's needs to meet the minimum standards of living or to participate in the society to which they belong. Within the monetary child poverty measures, the identifications of the threshold, either absolute or relative, as well as either the per capita approach or the child-specific approach, will influence which children will be identified as poor children. While it is an important concept in the discussion of poverty, the utilisation of child cost and equivalence scales measures for the extent of child poverty in Indonesia have not been empirically tested.

Because of intra-household allocation and the availability of common property resources and state-provided commodities, the inability to meet necessities, a low standard of living, and inability to participate in society are not always outcomes of a lack of resources. Although there is no doubt that resources are an important element in child poverty discourses, resources alone are unable to provide a complete picture of child poverty.

This chapter also discussed multidimensional perspectives of child poverty measures such as absolute deprivation, relative deprivation, well-being, capability, and social exclusion. Based on careful consideration, this thesis focuses on absolute and relative deprivation to investigate non-monetary aspects of multidimensional child poverty. The concept of deprivation helps to provide a better picture of what child poverty means. From the absolute perspective, children can be considered deprived when they are unable to meet their basic needs, regardless of who lacks the resources – the children or the households in which they live. From the relative perspectives, children can be considered deprived when they are unable to participate fully in the society to which they belong. Participation means many things, not only having the essential necessities and the living standards that are considered adequate by society, but also having access to public services and even having a role in socio-economic activities in society. While absolute deprivation and relative deprivation may

provide different information about child poverty, relative deprivation has never been tested in Indonesia, and there is no evidence about how those concepts and measures are compared in a practical matter using the population survey data.

This chapter acknowledged that a theory-based comparison could indicate some appropriate child poverty concepts and measures. Therefore, reviewing and testing each child poverty measurement approach based on the available data to find the best measure is extremely important. The reviewing and testing may be unable to provide information about the most appropriate child poverty concept and measure in Indonesia. Nevertheless, they will help to reveal what each method can contribute and the most appropriate use of each method. From the monetary lens, this thesis empirically tests relative and absolute child poverty measures. From the multidimensional lens, this thesis empirically tests absolute deprivation and relative deprivation

CHAPTER 3. THE CONTEXT OF CHILDREN AND POVERTY IN INDONESIA

Chapter Summary

This chapter provides a general introduction to Indonesia, and to the context children and poverty in Indonesia.

- Indonesia is a large archipelago country with more than 17,000 islands and a population of more than 255 million.
- Children make up 29% proportion of the Indonesian population
- Children are receiving increasing policy attention.
- Poverty is a significant issue in Indonesia, according to Government statistics estimate 10.64% of the population are poor
- The way that childhood is conceptualised locally can be seen in regulation and in social practice.
    - Protection of children is articulated in Indonesian regulations.
    - Indonesia has ratified the United Nations Convention on the Rights of the Child (UNCRC).
- Indonesia does not have a clear definition or single approach to child poverty in its legislation.
    - The definitions of poverty in Indonesian legislation and policy frameworks are contested and do not differentiate child poverty.
    - Indonesia does not have a clear target on eradicating child poverty and does not have a policy that is focusing on child poverty.
        - The Indonesian poverty reduction strategy focusses on poor households, including those with children. However, poor children do not necessarily same as poor households.
        - Children as individuals with different needs to adults are not taken into account in the poverty measures applied by government.
        - The effectiveness of household-based poverty reduction strategies to eradicate child poverty should be contested.
- Current estimates of child poverty in Indonesia suggest that between 13 and 65% of children are poor.
- However, current estimates do not adequately compare the different child poverty measures.
        - Limited discussion of agreement and differences among child poverty measures.
        - Limited discussion which measures are most appropriate to measure child poverty in Indonesia.
        - Scope comparison is limited between monetary and human right based approach.
        - Additionally, there is room to test the application of relative deprivation.

3.1 Overview of Indonesia

Indonesia has an essential role to play in the study of child poverty. The country has unique geography and a large, significantly diverse population. Indonesia is also undergoing government transitions and has an emerging economy that is experiencing rapid economic growth.

3.1.1 Geography

Indonesia is an archipelagic country with over 17,000 islands, though only approximately 35% (6,000) of the islands are inhabited. The five largest islands are Sumatra, Kalimantan (Borneo), Java, Sulawesi, and Papua (Phillips, 2005). Indonesia is also a tropical country with two seasons: dry and rainy (Phillips, 2005). In 2010, approximately 60% of the country's area was covered by forest (Global Forest Watch, 2018). Indonesia also forms part of the ring of fire and is one of the countries with the largest numbers of volcanoes in the world (127 volcanoes), many of which frequently erupt. Indonesia is also the meeting point of several earthquake plates (CFE-DMHA, 2015). Indonesia has a fertile, tropical soil that has potential for agriculture and forestry. The country also has significant mineral and mining potentials (Phillips, 2005) and potential for fishery (FAO, 2011). However, Indonesia is currently experiencing rapid deforestation (Margono et al., 2014), and its geographic conditions also mean a high risk of natural disasters, including floods, volcano eruptions, and major earthquakes (CFE-DMHA, 2015).

3.1.2 Demography

Indonesia is not only the most populous country in Southeast Asia (Jones, 2013), but also the fourth most populous country in the world, after China, India, and the United States of America (U.S. Census Bureau, 2016). The most recent population census, the National Population Census conducted in 2010, found the population of Indonesia to be 237,641,326 people (BPS, 2016b) and estimated that by 2015, the population would rise to 255,461,700 people (BPS, 2016a).

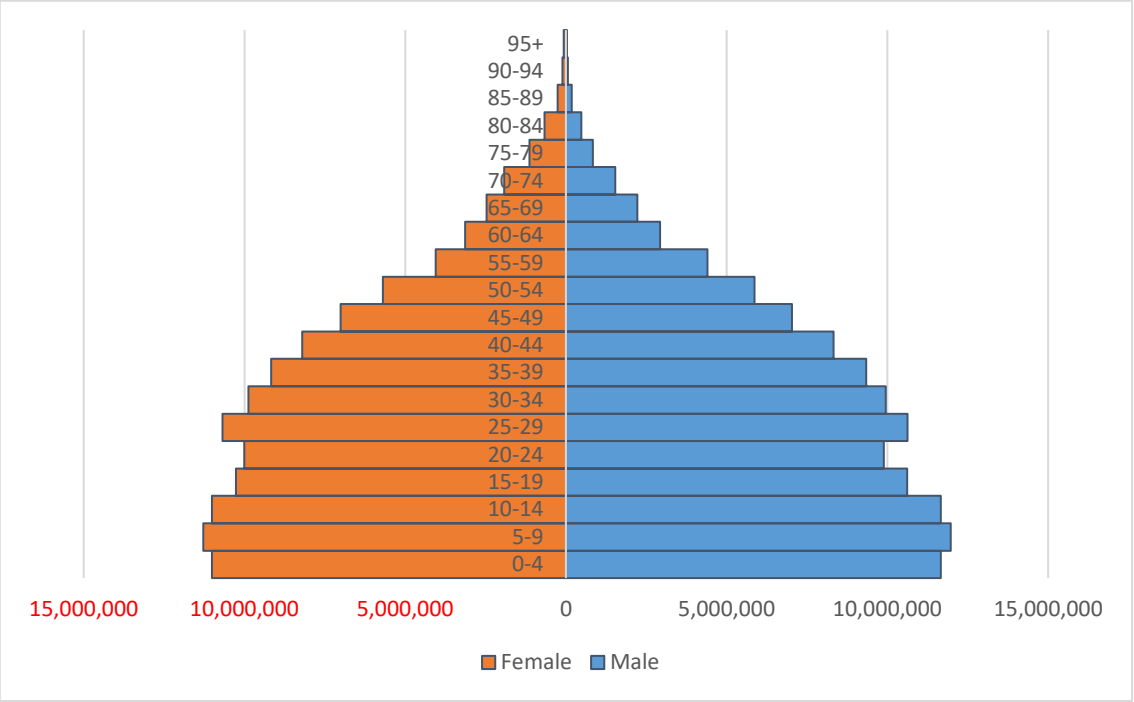
Figure 3-1. Population Distribution in Indonesia

Source: BPS (2016b)

The Indonesian population is distributed unequally. As shown in *Figure 3-1*, the population is concentrated in the western part of the country, on Java in particular. Java is inhabited by over half of the Indonesian population, while the eastern parts of Indonesia, such as Papua, have a much smaller population (BPS, 2016b).

Indonesia is also experiencing rapid urbanisation. The urban areas are expanding as more people come to live and work in the cities. In 1950, only 15% of the country's population lived in urban areas (Sarosa, 2006), but the most recent population census in 2010 indicated that almost half of the population was living in urban areas (BPS, 2016b).

Figure 3-2. Population Pyramid of Indonesia



Source: created based on BPS (2016b)

Indonesia has a relatively young population. As seen in *Figure 3-1*, the pyramid is relatively wide from the middle to the bottom. According to recent data, approximately 29% of the population is younger than 15 years old (BPS, 2016b), and approximately 32% of the population is younger than 18 years old (Kementerian Pemberdayaan Perempuan dan Perlindungan Anak, 2018). These percentages of younger people are higher than those in neighbouring countries, such as Australia (19%), Malaysia (25%), Singapore (15%), and Thailand (18%) (World Bank, 2017). On average, OECD countries typically have 18% of their population under 15 years old (OECD, 2016b). But because of Indonesia's large population, the country has a large number of children. Based on the 2015 figure (BPS, 2016a), there are more than 74 million people under 15 years old and 82 million under 18 years old in Indonesia.

3.1.3 **Population Diversity and Mobility**

The Indonesian population is diverse. There are a number of religions in Indonesia, such as Islam, Roman Catholicism, Protestantism, Hinduism, and Buddhism. Islam is the dominant faith with 88% of the population (Phillips, 2005).

Indonesia also has a number of local languages and dialects. The National Statistics Office recorded 1158 local languages in their 2010 population census guideline (BPS, 2010), which found that almost 80% of the population over 5 years old used local languages for daily communication (BPS, 2012b).

There are approximately 633 ethnic groups in Indonesia (Ananta et al., 2014; Ananta et al., 2015; BPS, 2012b). According to the population census of 2010, Javanese and Sundanese are the largest ethnic groups, most members of which live on the island of Java (Ananta et al., 2014; Ananta et al., 2015; BPS, 2012b). Based on DNA distribution, the Indonesian population is a mix of different groups of ancestors that came in waves from places such as Africa, Vietnam, Formosa, India, Arabia, and China (Tumonggor et al., 2013).

During the 1980s, with support from the government, people migrated from densely populated islands such as Java and resettled on other islands; the government's aim was to reduce the population imbalance between Java and outer islands (Arndt, 1983; 1984). However, this effort was ended because of various problems and financial constraints (Leinbach, 1989). The current trend of internal migration in Indonesia is urbanisation, with people moving to urban areas to look for work (UNESCO et al., 2018; Wajdi et al., 2015).

3.1.4 **Governance**

Since Indonesia's independence in 1945, there have been four periods of governance, namely the authoritarian regimes of the old (1945-1967) and new order (1967-1998), the transition period (1998-2001), and the current decentralisation (Alm et al., 2001; Rock, 2003). Since early 2001, Indonesia has implemented decentralisation (regional autonomy) to reduce the hierarchical relationship between provincial and district governments. The people now select their district heads and Parliament representatives. District governments are more accountable to locally elected district heads and must report to locally elected Parliaments rather than to the provincial government. The provinces retain a hierarchical relationship with central government (Alm et al., 2001; Darmawan, 2008). Certain responsibilities have been transferred from central government to provinces and districts, including important sectors for children, such as healthcare, education, and social welfare (Alm et al., 2001; Darmawan, 2008).

In theory, local knowledge combined with legislative authorities and local government policies in the process of resource allocation and planning can be a solid foundation in generating innovations to improve children's well-being (UNICEF, 2011; 2012).

However, the quality of governance and public services for children do not necessarily improve after decentralisation. There are issues that must be addressed in terms of the implementation of decentralised governance. Because of decentralisation, it has become apparent that some districts have limited capacity and human resources to deliver effective governance and provide adequate services that ensure children's well-being (Heywood and Choi, 2010; Kurniawan et al., 2012; Miharti et al., 2015; Muttaqin et al., 2015; UNICEF, 2012; World Bank, 2013). Additionally, coordination between actors in various level of government is weak, and there is a lack of harmonising rules and regulation, including those policies responsible for protecting children at the district and provincial level (UNICEF, 2011; 2012).

3.1.5 **Economy**

Indonesia has undergone a number of significant economic transitions. From rapid economic growth until 1996, Indonesia experienced economic shock caused by the 1997-1998 Asian economic crisis. The Indonesian economic crisis began in 1997, when the rupiah depreciated rapidly and brought Indonesia into the economic crisis of 1998. The devaluation of the rupiah increased the debt and operational cost of private companies, resulting in bankruptcies. These conditions stimulated a reduction in labour demand, rising unemployment, and a loss of social security coverage. The prices of goods and services increased significantly during the year, which worsened the quality of life of the lower income population and pushed the near-poor population, and their children, below the poverty line. Household consumption began decreasing in 1998, with investments in areas of human capital, such as health and education, decreasing as well (Cameron, 2000; Skoufias and Suryahadi, 2000; Sparrow, 2006; Strauss et al., 2004; Sumner, 2002).

However, the economy gradually recovered. The average yearly economic growth in post-crisis Indonesia (2000-2010) was more than 5%, and the debt to GDP ratio also dropped below 40% (Elias and Noon, 2011). In almost two

decades after the crisis, Indonesia has become a G-20 country, one of twenty countries with the largest GDPs in the world (Palmer and Jeyaratnam, 2014). Its GDP ranked 16th globally (World Bank, 2016b). With the largest economy in Southeast Asia, Indonesia is also one of the major economic powers in Asia (ASEAN Secretariat, 2017).

Despite the economic recovery, a number of issues remain. Because Indonesia has a large population, the GDP per capita in Indonesia is relatively low in comparison to the majority of G-20 members (World Bank, 2016a).

Furthermore, poverty is significant issue in Indonesia. The poor population in Indonesia is among the largest in Southeast Asia (Strawson, 2017). According to Indonesia's central agency on statistics, Statistics Indonesia (*Badan Pusat Statistik* – BPS), 10.64% of Indonesian population is poor in 2017 (which is equivalent to 25.95 million people) (BPS, 2018b). The poverty figure was estimated by BPS using monetary approach based on per capita expenditure (BPS, 2018b). Although no existing studies have compared the numbers of poor children in Southeast Asia, it is expected that the number of poor children in Indonesia is also among the largest in Southeast Asia because Indonesia has the largest number of children.

Disparities have also become a major concern. Some areas, such as eastern Indonesia, are not performing as well as western Indonesia, particularly Java and Sumatra (BPS, 2012a; SMERU, 2011). The distribution of provincial GDP indicates that almost 60% of the Indonesian economy concentrated in Java Island (BPS, 2018c). The inequalities between rich and poor are also increasing, which can be seen in the increase of Indonesia's Gini ratio (World Bank, 2015a). Those disparities not only exist in economic sectors, but also are apparent in public service provisions (del Granado et al., 2007; OECD/Asian Development Bank, 2015; Siagian, 2008; Suryadarma et al., 2011; UNICEF, 2011; 2012). Rural areas are significantly poorer than urban areas, especially those in the eastern regions of Indonesia (BBC News Asia, 2018; BPS, 2012c; Effendi, 2008; Molet, 2007; Nurhadi, 2015; Siagian, 2008; SMERU, 2011; UNICEF, 2011).

3.2 Children and Childhood in Indonesia

In Indonesia, children and childhood have a number of definitions. While it is generally agreed upon that children are young people, concepts are contested.

3.2.1 The Legal Status of Children

The legal status of a child is regulated in the national constitution and covers children's definitions, rights, and protection. The Indonesian government defines children as individuals under 18 years old, including children in the uterus, in its child protection law (GOI, 2002b). The standard of childhood spanning up to 18 years old follows the standard of the UNCRC (UNGA, 1990). Therefore, the concept of children is binary, as an individual aged younger than 18 years old is categorised as a child, and an individual aged 18 years old or older is categorised as an adult.

The rights and protection of children were introduced in constitutions and elaborated further in various laws, particularly in those concerning children's rights (GOI, 2002b; 2012; 2014; Save the Children, 2010; SMERU, 2011). The basic constitution of Indonesia, the amendment of the 1945 constitution, states that "every child shall have the right to live, to grow and to develop, and shall have the right to protection from violence and discrimination" (GOI, 2002a: article 28B, No. 2). The constitution also outlines that "Impoverished persons and abandoned children shall be taken care of by the state" (GOI, 2002a: article 34, No. 1). The National Child Protection Law, Law No. 23/2002 (GOI, 2002b), and its amendment (GOI, 2014) are the follow-up to the ratification of UNCRC and have become an interpretation of the UNCRC in an Indonesian context. Therefore, this law has also become the umbrella for other laws related to the fulfilment of children's rights and protection (Save the Children, 2010). The basic objective of the national child protection law is to guarantee and protect the rights of children, ensuring their survival, growth, and development (GOI, 2002b; 2012; 2014; Save the Children, 2010; SMERU, 2011).

The law (GOI, 2002b) is divided into 14 chapters. In general, this law regulates the rights and obligations of children, as well as the responsibilities of the state, government, society, family, and parents in ensuring child protection. The law also discusses the status of the child, power upbringing, custody and adoption of children, basic regulation for the implementation of child protection, public

participation, and the establishment of the Indonesian Child Protection Commission. More importantly, this law covers the regulation of criminal provisions. Though the content was not changed significantly, the national protection law was amended by Law No. 35/2014 (GOI, 2014).

In the context of the juvenile justice system, the child protection law is supplemented by the law of the child criminal justice system (GOI, 2012). The main focus of this law is restorative justice and diversion. Restorative justice is achieved through the rehabilitation of child offenders through ensuring that they are aware of the impact of their actions. Diversion is an alternative care programme for child offenders instead of formal prosecution in the criminal justice system.

The juvenile justice system suggests that the 18-years-old standard is not universally applied in Indonesian legislation, where the age threshold for children who break the law and are liable to receive punishment is 12 years old (GOI, 2012). Therefore, children who are 12 years old or older are prosecuted when they break the law. However, if the offender is below 15 years old, restorative justice and diversion are prioritised over criminal prosecution.

3.2.2 **The Social Construction of Children**

The concept of childhood is socially constructed (James et al., 1998), so the social role of children is an important aspect in understanding children and childhood in Indonesia. It is widely believed that the role of children is to study and play, which is contrary to the role of parents, who must earn income and nurture children (Gustiana, 2012; Nurhadi, 2015; Suyanto, 2016; Tedjasaputra, 2001). This division of roles has also been proposed as an example of a prosperous family in the government-led family planning campaign (Newland, 2001). However, these traditional roles are not always fulfilled. On some occasions, children may be required to take on adult roles. When children are living in poverty, they may not be able to enrol in school (del Granado et al., 2007; OECD/Asian Development Bank, 2015; Sparrow, 2006) and instead must work and earn money (Bessell, 2009).

3.2.2.1 Children as Capable Beings

The role of children in Indonesia entails that they are “capable beings” that can participate in a number of household tasks. However, defining children as

capable beings may blur the distinction between adults and children. The concept of 'capable' should not be considered as a binary concept, capable or not capable, but instead in terms of the capabilities that children can attain (Ballet et al., 2011). Furthermore, in practice, treating children as capable beings does not necessarily mean that children, particularly younger children, are capable of decision making, as there is little evidence of children being capable of taking part in decision-making processes. Children may have the opportunity to make decisions related to their consumption, e.g. deciding what they want to buy or eat, but they are unlikely to be deciding how much money they should be given or which school they should attend. However, some circumstances mean that children must be involved in decision-making. For example, as revealed by Bessell (2009), in a study of Jakarta, children who left home to live on the street or work far from their family were required to make decisions by themselves.

3.2.2.2 Children and Families

Children play a specific role in the Indonesian family. The role of children involves supporting domestic work and family business. In the rural area, young children are often involved in domestic work, particularly in caring for younger siblings and assisting in agricultural work (Darroch et al., 1981; Megawangi et al., 1995). The involvement of children in helping adults is also apparent in a number of traditional societies in Papua, where young children, when they are considered strong enough, help their parents in hunting (Molet, 2007).

Cultural practices also shape the role of children in the family. For example, in Javanese culture[1], children are considered a source of wealth and happiness. Darroch et al. (1981) and Megawangi et al. (1995) argue that traditional Javanese society in rural areas consider children an investment in the form of additional manpower for labour and security in old age, so having more children means a larger investment.

Economic contribution is not the sole reason that families decide to have children. In some cases, having many children may be regarded as prestigious and enhance a family's social status (Megawangi et al., 1995). The preference for many children may be due to Indonesia's high child mortality rates in the 1950s

[1] Javanese is the largest ethnic group in Indonesia.

and 1960s. However, the attitude towards the ideal number of children gradually changed after the introduction of family planning in the early 1970s. Furthermore, the increased access to contraceptives, coupled with the improvement of health services and technologies, has led to reduced child mortality rates. Currently, the majority of Indonesian families prefer to have fewer children and to pay more attention to investing in the development of these children (Hull, 2002).

Families often have a preference for a specific gender. Healthy male children in traditional Dany tribes in the highland Papua, for instance, would receive strong support from their parents and communities as they are expected to succeed and ensure the lineage of the clan in the future. Female children may receive less support from the clan because they do not ensure family lineage (Butt, 1998).

3.2.2.3 Children and Education

Education is an important component of the life of Indonesian children, and one of a child's principal responsibilities is going to school. All children should attend basic compulsory education, which consists of primary school from ages 7 to 12 (six-year programme) and junior high school from ages 13 to 15 (ACDP, 2013; del Granado et al., 2007; GOI, 2003; OECD/Asian Development Bank, 2015). Governments subsidise primary education, which covers most of the cost of public education. However, private schools are expensive (del Granado et al., 2007; OECD/Asian Development Bank, 2015; Toyamah and Usman, 2004), and parents must cover other educational costs, such as transport cost and pocket money (Reality Check Approach Plus and UNICEF Indonesia, 2017).

On the other hand, secondary education is not compulsory. The government and private institutions offer secondary education, including general, religious, and vocational high schools. Although the government provides subsidies for secondary education, it is not free, even in government-run public schools (del Granado et al., 2007; OECD/Asian Development Bank, 2015; Toyamah and Usman, 2004). Parents must also cover other costs, such as pocket money (Reality Check Approach Plus and UNICEF Indonesia, 2017). A complete secondary education is gained when students aged 16 to 18 years old finish high school. Tertiary education is completed when those aged 18 years or older graduate from universities or polytechnic institutes (OECD/Asian Development Bank, 2015).

Based on the data from 2017 (BPS, 2018a), education enrolment is relatively high, particularly in primary schools (net enrolment rate for primary school is 96.71, and that of junior high school is 77.89). This rate drops sharply for secondary education and tertiary education (net enrolment rate for secondary school is 59.85, and that of tertiary education is just 17.93). This data also shows that 2.91% of children over 15 have never been in formal education, 11.43% of children enrol in primary school but do not finish, 27.83% of children have only completed primary school, 21.84 of children have only completed junior high school, and 36% of children have completed only up to their senior year in high school.

Additionally, early childhood education is not compulsory. There are a number of types of early childhood education, including community-based early childhood education (PAUD), nursery school, and kindergarten (World Bank, 2006). Early childhood education is largely privatised with a limited budget allocation and few subsidies available from the government (Denboba et al., 2015; World Bank, 2006). Parents and guardians are expected to pay school fees, especially for nursery school and kindergarten (Reality Check Approach Plus and UNICEF Indonesia, 2017; World Bank, 2006). In 2017, approximately 19.24% of children aged 3 to 4 and 49.39% of children aged 5 to 6 attended early childhood education in Indonesia (BPS, 2018a).

3.2.3 **Transition from Childhood to Adulthood**

There is no consensus on the threshold to distinguish children from adults. As discussed in section 3.2.1, the legal threshold for adulthood is based on age. However, there is no singular definition of children, and there are many interpretations of what differentiates a child from an adult.

3.2.3.1 Religious and Cultural Practices

The concept of transition is also influenced by religion. Since Islam is the religion of the vast majority of the Indonesian population, the Islamic concept of childhood transition, which is '*sunat*' and '*akil baligh',* is influential in Indonesia and neighbouring countries such as Malaysia and Brunei Darussalam. Indonesian Muslim male children may not formally be seen as adults until they undergo '*sunat'*, or circumcision. For Muslims, '*sunat'* is an important religious practice, especially for men, and should be carried out before puberty. This procedure is a

subject of cultural celebration, and parents invite neighbours and extended family to visit the children at home after they undergo the '*sunat'* (Maier, 1982). '*Akil Baligh'* means being able to think, knowing right from wrong, and experiencing puberty. Children who have experienced '*Akil Baligh'* will be physically regarded as having entered adulthood (Hambali, 2001).

In some local cultures in Indonesia, space is the basis of understanding children and their transition into adulthood. In the Minangkabau society in the western part of Sumatra, for instance, young men migrate from their villages to earn money and gain experience when they are considered as adult enough; this migration is called '*Merantau*'. According to Minangkabau culture, a young man is considered as immature if he is still living in the village (Hugo, 1982). The migration also appears to happen to young women who leave to look for jobs (Iman and Mani, 2013).

3.2.3.2 Child Protection and Vulnerable Children in Indonesia

Some situations can deprive children of their status as children despite the children being underage. These situations often represent the violation of child rights.

3.2.3.2.1 Child Marriage

Marriage is widely recognised as a transition into adulthood in many local cultures in Indonesia. However, 17% of young women aged 20 to 24 years old in Indonesia had their first marriage under the legal child protection threshold of 18 years old (Rumble et al., 2018). The child protection law (GOI, 2002b; 2014) contradict existing marriage laws, which set the minimum age of marriage slightly lower, at a minimum of 17 years old for men and 16 years old for women (GOI, 1974). Even using the lower thresholds of marriage law, the problem of child marriage is still found Of women aged 20 to 24 years old, 6% had their first marriage even under the 16-years-old threshold of marriage law (Rumble et al., 2018). After marriage, those girls may be socially recognised as adults and have social roles as adults despite being under the age of 18. Fortunately, child marriage has declined since 1985 (UNICEF, 2013b). Additionally, the marital status does not change children's legal status under child protection law.

3.2.3.2.2 Child Labour

From an economic point of view, children could be considered as entering adulthood when they start to earn money and become financially independent (Huebner et al., 2014; Reality Check Approach Plus and UNICEF Indonesia, 2017). However, this distinction between childhood and adulthood becomes a social issue if children start to work when they are underage. In 2009, it was estimated that 1.7 million children are in the labour force in Indonesia (BPS, 2009). Of that number, 320 thousand children aged from 10 to 12 are working, 341 thousand children aged from 13 to 14 are working more than 15 hours per week, and 1 million children from 15 to 17are working 40 hours per week (BPS, 2009). Children work for various reasons (Bessell, 2009; Nurhadi, 2015; Understanding Children's Work (UCW) Programme, 2012). Many children work to support their family or because they are unable to continue going to school, so working is their only option (Bessell, 2009; Understanding Children's Work (UCW) Programme, 2012). Some children have left their home because they have problems with their family, and hence they have to work for their own survival (Bessell, 2009). In urban areas, the majority of those children work in the manufacture (35%) and trading sectors (31%) (BPS, 2009). In rural areas, the majority of those children work in the farming sector (66%) (BPS, 2009). Under such situations, their rights are violated, and they often work in hazardous conditions (Kementerian Tenaga Kerja, 2005; Understanding Children's Work (UCW) Programme, 2012).

3.2.3.2.3 Child Exploitation

Child exploitation is commonly related to child trafficking for labour or sexual exploitation. Victims of trafficking often lose their freedom, are made to endure long working hours, and typically live far away from family (IOM, 2015; Suyanto, 2016). Children who are victims of trafficking are more at risk of experiencing sexual exploitation. Other groups of children are also at risk of sexual exploitation, for example, neglected children and children living on the street (ILO, 2009; Suyanto, 2016). Sexual exploitation undermines their social status as children and causes severe psychological trauma. They may also become victims of negative social stigma (Eddyono et al., 2017; ILO, 2009; Suyanto, 2016). There are no reliable statistics on trafficking in Indonesia since trafficking and sexual

exploitation victims are a hidden population (Fedina and DeForge, 2017; Tyldum and Brunovskis, 2005; Zhang, 2012). The estimated figures state that about 100,000 women and children of Indonesia are victims of sex trafficking every year (ILO, 2009). Between 2005 and 2014, the international organisation for migration (IOM) in Indonesia rescued 7,193 victims of trafficking, 16% of them children (IOM, 2015).

3.3 Understanding Child Poverty in Indonesia

The previous section discussed children and childhood in Indonesia. This section thus starts with a discussion on the definition of child poverty in Indonesian policies and legislation. It then examines the meaning of poverty according to people in Indonesian society. Finally, based on these discussions, it focuses on the meaning of child poverty in the Indonesian context.

3.3.1 Child Poverty in Indonesian Regulation and Policies

Ideas about child poverty in Indonesian regulation and policies are scattered and varied. For example, a statement in Indonesia's 1945 constitution declares, "Impoverished persons and abandoned children shall be taken care of by the state (GOI, 2002a: article 34, No. 1)". The concept of abandoned children, or '*anak terlantar*' in the Indonesian language, is the Indonesian constitution's way of defining poor children, although the term 'abandoned' does not necessarily have the same meaning as 'poor'. According to the child protection law (GOI, 2002b; 2014), '*anak terlantar*' are children whose basic needs, whether physical, mental, spiritual, or social, are not fulfilled. The definition of '*anak terlantar*', however, does not adequately explain what the basic needs of children actually are, so which children are covered by this legislation is open for debate.

Indonesian policies and regulations use various terms and interpretations in discussing poverty. In one of Indonesia's highest-level regulations, the 1945 constitution (UUD 1945), the term used to describe poverty is '*fakir miskin*' ('the poor'). The term is composed of two words: '*fakir*' and '*miskin*'. The concept of '*fakir*' mainly focuses on people who do not have sources of livelihoods, i.e. those who do not have jobs, business, or any other sources of earning. Meanwhile, '*miskin*' refers to people who have sources of livelihoods, but whose earnings

cannot meet their or their family's needs. Hence, '*fakir miskin*' describes people who do not have sources of livelihood and people who do have such sources but are still unable to fulfil their or their family's basic needs (GOI, 2011).

There are various interpretations of '*fakir miskin*'. In the Ministry of Social Affairs decree (Kementerian Sosial, 2013), for example, '*fakir miskin*' has various items which are interchangeable with the concept of '*tidak mampu*' (could not afford). The term '*tidak mampu*' focuses on affordability. It can be seen that '*tidak mampu*' has the same meaning with '*miskin*'. However, the concept of '*tidak mampu*' focuses on lack of essential necessities, which is a multidimensional issue, and mainly emphasises the non-monetary aspects of poverty. To some extent, the concept of *'tidak mampu*' is similar to the concept of deprivation.

The Ministry of Social Affairs identifies a set of criteria to identify the poor that combines '*fakir miskin*' and '*tidak mampu*' (Kementerian Sosial, 2013). The criteria are expected to help identify poor households that are already or not yet registered in the unified database for social protection. Below is the list of the criteria (Table 3-1).

Table 3-1. Ministry of Social Affairs' criteria to identify the poor (combination of the *fakir miskin* and *tidak mampu* definitions)

Domains	Indicators
Livelihood	• No sources of livelihood or sources of livelihood that do not grant the ability to fulfil their or their family's basic needs
Food	• Majority of expenditure is for staple and basic foods
Health Access	• Unable to access health services beyond community health centres or subsidised health services
Education	• Only able to send children to study until junior high school
Clothes	• Unable to buy clothes once a year for all household members
Water	• Using unprotected water sources for drinking water
Energy	• No electricity access or electricity without a meter
Housing	• House has low-quality walls • House lacks flooring or has low-quality flooring • House has low-quality roofing • Width of the floor of the house is less than 8 m^2 per person

Source: Ministry of Social Affairs decree (Kementerian Sosial, 2013)

Despite the conceptual aspects of poverty covering a wide range of domains, for practical usage, the definition of poverty tends to be narrower and to cover only monetary poverty. Indonesia's central agency on statistics, Statistics Indonesia (*Badan Pusat Statistik* – BPS), for instance, defines poverty as living below the poverty threshold. This definition has become the operational definition in the context of poverty measures (BPS, 2018b). However, this definition does not distinguish the difference between '*fakir*' and '*miskin*' in the context of livelihood. It emphasises heavily that poverty is a lack of resources to the point that basic needs are not met. Thus, the organisation is employing the absolute poverty concept.

The basic-needs approach is the most common approach applied by BPS. It uses food and non-food expenditures to determine monetary poverty thresholds based on basic needs (BPS, 2018b; Cahyat, 2004). This approach argues that households with per capita expenditures below the poverty threshold should be categorised as poor, with every individual in the household also considered as poor (Priebe, 2014). Thus, it ignores household size, intra-household resources allocation, and the unique consumption needs of the household members (Cockburn et al., 2009; Gray, 2013; White and Masset, 2002). Furthermore, since BPS revised the methodology in several times, the poverty figures estimated using this method are not necessarily comparable over time (Priebe, 2014).

Other approach applied by BPS is ***the proxy-means test***. It is used to identify non-monetary poverty indicators and employs expenditure as the reference (World Bank, 2012). The basis for the proxy-means test is the household expenditure. The selection of indicators also focuses on household levels. Therefore, this approach shares similar problems with the basic-needs approach, namely failure to consider intra-household resources allocation.

Based on the discussion above, it can be concluded the government of Indonesia does not have any explicit definition of child poverty. The concept of '*fakir miskin*' (Kementerian Sosial, 2013), as one of legal bases to define poverty, is more relevant to adults since it relates to livelihoods and income sufficiency. The concept of '*tidak mampu*' also pays more attention to ability to afford the basic needs and thus does not specifically consider children. Meanwhile, the definition

of BPS (2018b) pays more attention to monetary poverty at the household level and does not distinguish adults and children.

3.3.2 **Public Views about Child Poverty**

To inform understanding of child poverty, some studies have tried to identify adults' views and experiences of poverty (Reality Check Approach Plus, 2015a; Wisor et al., 2015). Other studies (Bessell, 2009; Reality Check Approach Plus and UNICEF Indonesia, 2017; SMERU, 2011) have used children's views on poverty.

3.3.2.1 Adults' Views

Two studies (Reality Check Approach Plus, 2015a; Wisor et al., 2015) have not necessarily focused on child poverty, but the experiences of poverty captured therein have been proposed as applicable to all household members (including children). Those studies have informed various domains of poverty, most of which are appropriate for discussion of child poverty.

Wisor et al. (2015) conducted a study in Angola, Fiji, Indonesia, Malawi, Mozambique, and Philippines. They identify 25 poverty domains via a qualitative research. These domains are as follows: food, clothing, water, shelter, toilet facilities, cooking fuel, electricity, health care, education, property ownership and inheritance rights, sexual autonomy, family planning, freedom from violence, freedom from disruptive behaviour of other people, personal care, free time, location of necessary services and resources, freedom of movement, information and communication, discretionary items, debt/assets/ access to credit, participation in community functioning, voice in community, family relationship, and environment. These domains indicate that people perceive poverty as beyond the scope of material well-being; poverty, in the respondents' eyes, includes social wellbeing and personal freedoms. However, this finding is not particular to Indonesia.

Focusing on the Indonesian context, the Reality Check Approach Plus team investigated how poor people define the general concept of poverty (Reality Check Approach Plus, 2015a) and how poor people view hygiene and nutrition (Reality Check Approach Plus, 2015b). The team used a combination of

observations and interviews conducted during short-term stays with poor families in semi urban and rural areas. The first part of the study (Reality Check Approach Plus, 2015a) revealed that adult informants see various meaning of poor. Poor is those who need help because they are either incapacitated (due to chronic illness, disabilities, or old age) and thus cannot earn cash, in particular, this is due to abandoned or lost immediate family support. Poor is also those in caring positions (e.g., looking after the elderly, very young, or people with disabilities) that make it difficult for them to earn cash. Moreover, the poor are unskilled daily-waged labourers and are not employed on a permanent basis and hence unable to plan or think about the future or gain access. They lack access to metered electricity and are unable to eat socially acceptable food. They have insufficient cash to cover increasingly cash-based transactions, yet lack options to raise 'instant cash' or are unqualified to borrow money from formal money lending institutions due to inadequate collateral (They have to obtain money from informal lenders or sell their belongings). They tend to belong to minority groups with limited access to local decision-making structures and facilities and often live in fear (due to ethnic tensions, lack of documentation, illiteracy) and difficult-to-access locations. The part of the study focused on hygiene and nutrition for the poor (Reality Check Approach Plus, 2015b) found limited awareness of hygiene and nutrition among the poor informants. Although the informants acknowledge the importance of hygiene and nutrition in general, the knowledge, attitudes, and behaviours indicate the opposite situation. For example, many of them do not use a proper toilet and provide inappropriate food for their children.

3.3.2.2 Children' Views

Some studies have tried to capture different views of child poverty from children's perspectives (Bessell, 2009; Reality Check Approach Plus and UNICEF Indonesia, 2017; SMERU, 2011). These studies have largely confirmed that child poverty is not necessarily about lack of income, although lack of income is considered as an important element.

The qualitative phase of a study conducted by SMERU (2011) with students aged 7-18 years old in urban and rural areas in Indonesia focused on the problems and situations (e.g. lack of necessities, hunger, conflict, and natural disasters) that contribute to a sense of deprivation among children. The study also elaborated

on children's views and feelings regarding the daily activities and yearly events that influence their lives. The study found that receiving attention and affection from friends and family; having pocket money or earning money; doing well at school; owning socially acceptable goods like a mobile phone or bicycle; having freedom from many routine tasks and activities, such as freedom from household chores; and going on holiday are sources of children's wellbeing. Children who do not fulfil the needs related to those items tend to feel deprived.

Meanwhile, Bessell (2009) conducted a qualitative study in Jakarta, the capital city of Indonesia, to deepen understanding of the relationships between child labour and poverty. She collected data by interviewing working children aged between 10 and 16 years old, gathering their views and experiences of poverty and questioning how those views and experiences related to their activities as child labourers. She found that most of the working children identified themselves as poor, despite expressing the extent and nature of poverty differently among themselves. The children's interviews indicate that there is no universal definition of poverty, since the children were experiencing different forms of poverty. The children highlighted the common characteristics of the poor as having a lack of money, limited access to education, negative experiences with schooling, a lack of food, improper shelter, and an inability to afford housing rent. These characteristics were coupled with feelings of insecurity about both their personal and family lives. The characteristics and feelings together shaped the children's experiences of poverty.

As a follow up on the previous studies, UNICEF and the Reality Check Approach Plus team (2017) collaborated to study further children's and their family's views on poverty. Building on the previous study with parents (Reality Check Approach Plus, 2015a), the study (Reality Check Approach Plus and UNICEF Indonesia, 2017) found that the poor are typically viewed as lacking financial resources. However, children mainly view lacking financial resources as not having adequate pocket money. Additionally, children also see lacking financial resources as an inability to pay school fees; although inability to pay school fees may not become an issue in primary school because of subsidies, it can become an issue in secondary school, as tuition is not free. Children also view the poor as being hungry. Furthermore, children perceive poverty as being related to the

occupation of their parents and to the kind of house the children are living in (e.g. the house's size, material, and whether it is rented or owned). Some stigma is attached to living in an illegal settlement. Children also see poverty as material deprivation, especially as not having a phone, TV, or motorbike. According to children, poverty is also related to relatively deprived areas.

Providing additional evidence from a qualitative study with children aged 6-17 in urban areas, Bima et al. (2017) identify key areas of well-being for urban children. The key areas, according to the children, are housing, means of transport (vehicles), the physical appearance of children, foods, occupations of parents, social relations, recreational activities, amount of money owned, access to education, and access to health facilities. Children feel deprived when lacking those items.

The various conceptions of poverty and child poverty as used in regulation and as conveyed by the informants in the research above confirm that there is no single understanding of child poverty. Inconsistencies exist between its concept and its operational definitions. However, a few agreements among those conceptions include the acknowledgement that poverty is multidimensional, covers both monetary and non-monetary dimensions, and refers to the most disadvantaged populations.

3.4 Policies and Intervention to Reduce Child Poverty in Indonesia

This section provides overviews of poverty and intervention to eradicate child poverty. It was started through a general discussion of the relationships between poverty and the realisation of child rights in Indonesia. Then the position of children in poverty reduction and the intervention to deal with child poverty was introduced.

3.4.1 Poverty and Realisation of Child Rights in Indonesia

The discussion of child poverty cannot ignore the realisation of child rights. The assessments of child-related indicators in Indonesia show unsatisfactory results. A joint NGO assessment in the context of the implementation of the UNCRC showed that Indonesia had achieved very little in improving children's well-being and acknowledging children's rights (Save the Children, 2010). Indonesia has

also had mixed results in the achievement of millennium development goals. The country's progress was on track to meet the goals on reducing monetary poverty, increasing school enrolment rates, expanding disease prevention, and reducing child mortality under the age of 5, but it was off track in achieving safe water and sanitation targets (Lundine et al., 2013). The baseline analysis of sustainable development goals also confirmed that many indicators of child well-being need to be improved, especially in the Eastern parts of Indonesia (BAPPENAS and UNICEF, 2017).

The government, as the representation of the state, is the main duty bearer to fulfil child rights. The unsatisfactory results are thus alarming, as the government of Indonesia has failed to fulfil child rights in the country. The government of Indonesia has already created various regulations to support the realisation of child rights (GOI, 2002b; 2003; 2011; 2012; 2014), but that regulation is not adequate. Although regulations are important as guidelines, the result depends on how those regulations are translated into actions. For example, Indonesian regulation mandates that a minimum of 20% of the country's budget should be allocated for education (GOI, 2002a). While the budgets are allocated according to the regulation, the budget structure is problematic. Salary payment and other ineffective allocations such as teacher training and meetings, for example, have a significant share in the budget compared to budget allocation that directly benefits students (ACDP, 2013; del Granado et al., 2007; Toyamah and Usman, 2004).

However, the human rights-based approach further suggests that the government is not necessarily the sole duty bearer. Civil society and the private sectors, for example, can also contribute to the enhancement of Indonesian children's well-being. Family and community are duty bearers as well, even though their duties are not clearly discussed in Indonesian child protection law (GOI, 2002b; 2014). Therefore, Indonesia may need to explore ways to involve stakeholders and other duty bearers more effectively in improving the well-being and realising the rights of children in the country.

Additionally, to enhance child well-being, poverty is an issue that cannot be neglected. As discussed in the previous chapters, poverty is a crucial issue that constrains the realisation of child rights. Poverty may also be one of the

underlying issues hindering the achievement of child rights' realisation in Indonesia. The issues of poverty in Indonesia have received significant attention from the government and stakeholders, but that attention has not necessarily been harmonised with efforts to realise child rights.

3.4.2 Position of Children within Government-led Efforts towards Poverty Alleviation in Indonesia

To improve the effectiveness of poverty alleviation in the country, since 2010 the President of Indonesia has initiated presidential regulations about poverty reduction acceleration (GOI, 2010). The government of Indonesia has integrated poverty alleviation programmes into four clusters: The first cluster comprises programmes aimed at the enhancement of social protection mainly for poor households. The second comprises programmes aimed at improving access to basic services. The third comprises community empowerment programmes that aim to enhance the ability of communities to improve their inhabitants' quality of life; one of these programmes is implemented through a national programme for community empowerment (PNPM-*Mandiri*). The fourth comprises programmes aimed at enhancing inclusive development though small and medium enterprises and access to financial services; one of these programmes is realised through the programme that provide credit for micro and small business *(Kredit Usaha Rakyat-KUR)* (Santoso, 2018; TNP2K, 2012; 2014). These programmes are operated by several government agencies at both the central and regional levels and are based on four fundamental strategies (Santoso, 2018; TNP2K, 2012; 2014).

Despite having various channels of poverty alleviation, the policy documents (Santoso, 2018; TNP2K, 2012; 2014) show that most of these programmes have been developed to deal with only general aspects of poverty; the social protection programme is perhaps the only exception, as it does pay some attention specifically to children. Child poverty is not a criterion to select target beneficiaries (TNP2K, 2014; World Bank, 2012). Therefore, most programmes do not directly benefit poor children. In short, very few poverty reduction efforts aim to benefit poor children directly (Santoso, 2018; TNP2K, 2012; 2014). However, although the target beneficiaries of such interventions are the households, all of the households' members, including their children will benefit (Bah et al., 2014;

Sparrow, 2006; TNP2K, 2014; World Bank, 2012). In other words, children may benefit indirectly, for example, through improvement of the access to public services.

3.4.3 **Intervention for Poor Children in Indonesia**

The government is not the sole actor capable of initiating and carrying out interventions for poor children. Various other actors have found channels for intervention that directly benefit poor children, including private foundations, Non-Governmental Organisation (NGO), and religious institutions.

From the government side, direct support for poor children has been provided through social protection, which is part of the poverty alleviation program. Social protection is a programme to ensure the survival and the resilience of the poor as well as improvement of their access to basic services (Santoso, 2018; TNP2K, 2012; 2014). All of those interventions use a single database to identify the poor, namely the data collection for social assistance Programmes (Pendataan Program Perlindungan Sosial - PPLS) 2011, which was updated in 2015 (TNP2K, 2017). The poorest households in the country are ranked, and the 15.5 million poorest of the poor households receive family welfare cards (Kartu Keluarga Sejahtera - KKS). The social protection interventions and their target recipients are defined as follows (Suryahadi and Al Izzati, 2018):

- Rice for the Poor Households (*Beras untuk Rumah Tangga Miskin-Raskin*): Subsided rice, as a staple food, is provided to the poor to reduce their food expenditure.
- Family hope programme (*Program Keluarga Harapan – PKH*): A conditional cash transfer is provided to help the poor to help poor households meet their needs. Through PKH, the targeted households receive financial support if they fulfil certain responsibilities in regard to education and health.
- Indonesia smart programme (*Program Indonesia Pintar*): This programme is re-branding and expansion of Cash Transfers for Poor Students (BSM). Student subsidies, through scholarships, are provided for the poor. All students in poor households that have family welfare cards receive a

Smart Indonesia card (Kartu Indonesia Pintar - KIP). The poor students receive monetary support that can be withdrawn using the card.

- Healthy Indonesia programme (*Program Indonesia Sehat*): This programme is a re-branding and expansion of the Health Insurance for the Poor (Jamkesmas). Free public health insurance is provided to the poor to cover health costs. Every poor household that has a family welfare card receives a healthy Indonesia card (*kartu Indonesia Sehat - KIS*). The owner of the Indonesian health card thereby receives access to health services for free.

The government also deliver another intervention that focuses on the protection of children who are facing difficult circumstances such as abuse at home or homelessness. Rather than focusing on poverty reduction, this intervention pays more attention to the social welfare of the children. This intervention is relevant to child poverty because, as Suyanto (2016) recognises, family poverty is a factor that increases the risk of children being abused. Furthermore, Suyanto (2016) and Bessell (2009) also point out that poverty is a reason why children may move out of their home and become street children. Therefore, intervention and protection for children under difficult conditions are often associated with interventions for poor children.

Private foundations mainly contribute through corporate social responsibility projects. Although these projects mainly focus on the area surrounding company sites, some private foundations have provided contributions to broader areas. Foundations often join forces with Non-Governmental Organisations (NGOs) to deliver and implement projects. However, the core area of foundations' work is not necessarily relevant to child poverty. Nevertheless, their contributions have strong potential to support the eradication of child poverty and fulfilment of child rights (UNICEF, 2013a).

NGOs have made significant contributions to support the most deprived areas and destitute populations. They work in a wide range of sectors that are related to children, for example, nutrition, health, education, and the environment. Some NGOs even focus specifically on child well-being (Childfund International, 2018;

Plan International, 2018; Save the Children, 2018; World Vision International, 2018).

Religious institutions are also promising actors striving to address child poverty because about 90% of the Indonesian population is Muslim. The wealth transfer to the poor and other people who are meet the criteria, called zakat, is one of the five pillars of Islam (Ali and Hatta, 2014). People who are eligible to receive zakat are as follow:

- People who don't have means of livelihood
- People who are unable to meet basic needs
- People who help collect Zakat,
- People who convert to Islam,
- To free people from slavery
- People who are in debt
- People who are fighting for a religious cause
- Traveller who need financial assistant

There are two types: zakat al-fitr and zakat al-mal. The first is a mandatory donation to people who meet the criteria that tied to the celebration of Ramadhan. The amount of the zakat is same for every obliged individual, regardless the income status. The second is a donation based on wealth, wherein all obliged Muslims have to donate at least 2.5% of their accumulated wealth for the benefit of people who are eligible (Halimatusa'diyah, 2015). A study in Jakarta and surrounding districts found that zakat contributes to reducing poverty (Kasri, 2016). Considering the Indonesian population size, these religious donations may become a significant funding source to reduce child poverty when designed and managed properly.

3.5 Current Estimates of Child Poverty in Indonesia

In Indonesia, poverty measures are important aspects of poverty reduction as they are used as evidence for designing and implementing poverty reduction policy and interventions. The government requires information on the proportion of the poor to design macro level fiscal policy, for instance. The government also

needs information about the poor people, such as their names and addresses, to guide targeted social protection programmes (TNP2K, 2014; World Bank, 2012).

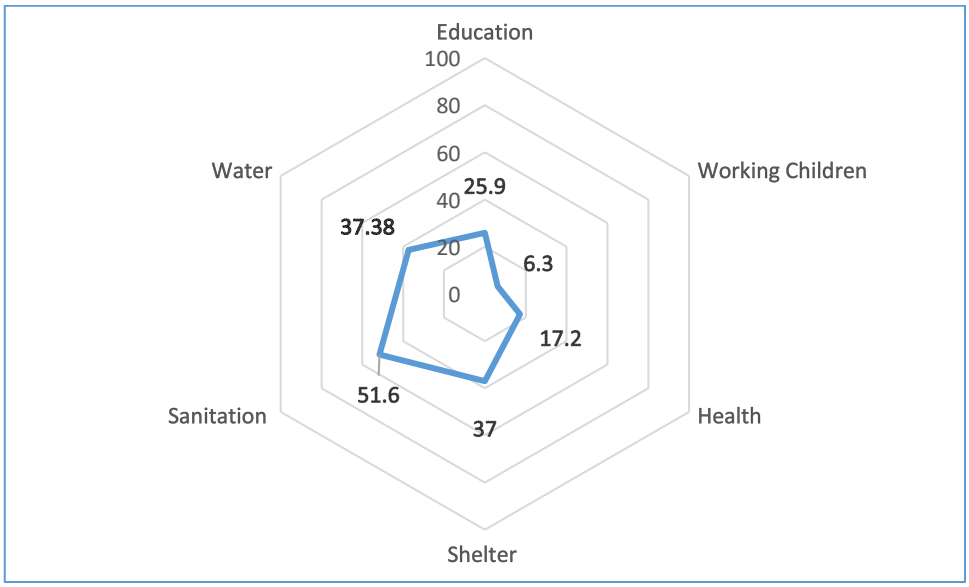
Considering that specific attention needs to be paid to child poverty measures, some promising progress has been made in child poverty measurement in Indonesia. Some studies differentiated monetary poverty based on age groups and estimates poor children (Bima and Marlina, 2017; BPS, 2017a; SMERU, 2011; UNICEF, 2017a). The situation from a monetary poverty viewpoint is problematic, given that SUSENAS 2009 data inform more than 50% of Indonesian children are monetarily poor according to the 2 USD/per-day monetary standard (SMERU, 2011). Furthermore, Bima and Marlina (2017) found that according to the national poverty threshold based on BPS's basic needs approach using SUSENAS 2013, more than 13.89% of children are poor, and almost 50% of children are vulnerable to becoming poor. The estimates of UNICEF (UNICEF, 2017a) and BPS (BPS, 2017a) based on the national poverty threshold using SUSENAS 2016 show that 13% of children are monetarily poor (UNICEF=13.3% and BPS=13.1%). That number is higher than the proportion adults of who are experiencing monetary poverty (9.7%) (UNICEF, 2017a). Comparisons of urban and rural data have indicated that monetary child poverty in rural areas is higher (Bima and Marlina, 2017; BPS, 2017a; UNICEF, 2017a). When observing the disparity by province (UNICEF, 2017a), the four provinces with the largest proportions of poor people (Papua, Papua Barat, Nusa Tenggara, and Maluku) are all located in the eastern part of Indonesia. Likewise, ten out of the sixteen poorest provinces are in the same area. However, a large number of the poor reside in Jawa Tengah (Central Java), Jawa Timur (East Java), and Jawa Barat (West Java), since the Indonesian population is concentrated in these three provinces.

Some scholars have recently introduced and tested child-sensitive measures that are based mainly on multidimensional analysis of deprivation. The first study dedicated to measuring the extent of child poverty in the country focuses on absolute deprivation and applies an adapted version of the Bristol Method and human-rights approach (SMERU, 2011). This study was then followed by a further application of the Bristol Method (Landiyanto, 2013); an analysis of unidimensional child poverty indicators (Patunru and Kusumaningrum, 2013); a

study on the associations among deprivation indicators (Hadiwidjaja et al., 2013); and another application of the human-rights approach using Multiple Overlapping Deprivation Analysis (MODA) (Bima and Marlina, 2017; BPS, 2017a; UNICEF, 2017a).

The data show that child poverty is a crucial issue in Indonesia (Bima and Marlina, 2017; BPS, 2017a; Hadiwidjaja et al., 2013; Landiyanto, 2013; Patunru and Kusumaningrum, 2013; SMERU, 2011; UNICEF, 2017a). Using SUSENAS 2009, SMERU (2011) found that almost 30% of Indonesian children are deprived of two or more non-monetary indicators, mainly sanitation, water, and shelter (*Figure 3-3).* Using a different set of indicators and SUSENAS 2013 data, Bima and Marlina (2017) found lower estimates of multiple deprivation (about 15%). Using MODA and SUSENAS 2016, UNICEF (UNICEF, 2017a) and BPS (BPS, 2017a) found the proportion of children who are deprived in two dimensions or more to be 65.3 and 64.94% respectively.

Figure 3-3. Deprivations experienced by Indonesian children (%)



Source: SMERU (2011)

Based on a domain-level analysis, utilities are becoming a main issue. SMERU (2011) found that more than half of all Indonesia children are deprived of access to improved sanitation facilities and 37% are deprived in terms of access to improved water sources. This finding is consistent with the finding of UNICEF (2017a) that an estimated 70% of children are deprived in utilities (73% in rural

areas and 40% in urban areas). The analysis based on provinces, also shows that the situation within Eastern Indonesian provinces such as Moluccas, Papua, and Papua Barat appears to be worse compared to other provinces (UNICEF, 2017a). While SMERU (2011) does not encompass the multiple deprivation indices at the provincial level, the data from individual deprivation indicators, such as water, sanitation, shelter, and education, show that children in those provinces are among the most deprived in Indonesia (Hadiwidjaja et al., 2013; Landiyanto, 2013; Patunru and Kusumaningrum, 2013; SMERU, 2011).

Child poverty is associated with many factors. Understanding how child poverty differs according to those factors, and whether disparity exists according to those factors, provides some insight into the nature of child poverty. From a demographic perspective, poor households tend to have a larger family size (UNICEF, 2017a). Household characteristics are also an important factor associated with household poverty. In her qualitative studies in Jakarta, Bessell (2009) indicated that there is an association between family background, child poverty and involvement in child labour. Bima and Marlina (2017) and UNICEF (2017a) found that increased educational attainment of household members decreases households' probability of being poor. Location is another important factor associated with child poverty in Indonesia. Previous studies have shown that child poverty in rural areas is higher than in urban areas (Bima and Marlina, 2017; BPS, 2017a; SMERU, 2011; UNICEF, 2017a). Studies have also found that child poverty in provinces outside Java are higher than in provinces in Java (SMERU, 2011; UNICEF, 2017a).

The impact of child poverty on Indonesia cannot be underestimated. One previous study showed that less than 40% of all 16- to 18-year-olds from the poorest quintile in Indonesia enrol in high school, compared to more than 80% from the wealthiest quintile (SMERU, 2011). The same previous study also found that while approximately 75% of children from the wealthiest quintile of families in Indonesia receive all the basic vaccinations, only 50% of the children from the poorest quintile receive the same vaccinations (BPS, 2012a). Furthermore, 60% of the poorest children in Indonesia lack access to improved sanitation facilities, compared to 5% of children from the wealthiest quintile (SMERU, 2011). A high proportion of the children who are experiencing deprivation appear to be

experiencing deprivation on multiple levels (Bima and Marlina, 2017; Hadiwidjaja et al., 2013; World Bank, 2015c).

3.6 Conclusion: Gaps in the Literature about Child Poverty in Indonesia

This chapter has overviewed the various conceptions of children, childhood, and transition to adulthood in Indonesia and acknowledged that differences in definitions of these concepts contribute to the complexity of protecting and supporting Indonesian children and to the difficulty of defining the relationship between children and poverty in Indonesia. This chapter has also highlighted that understanding childhood in Indonesia is complicated because children have different age thresholds and, according to age, different needs. Additionally, while children are entitled to child rights, some of those rights, for example, education rights, may be specific to certain age groups. However, the multidimensionality of child poverty measures allows the operationalisation of different age standards in various child poverty indicators into meaningful indices.

There is room to improve regulations and policies. Indonesian regulations have articulated child protection issues. Indonesia has also ratified the United Nations Convention on the Rights of the Child (UNCRC). However, there are inconsistencies in the regulations aimed at fulfilling child rights and in the extent to which those regulations are acted upon. Indonesian legislations also lack a clear definition of child poverty, despite the country placing considerable emphasis on poverty reduction. Even the definition of poverty and children in Indonesian legislation and policy frameworks are sometimes conflicting. The definition of poverty applied in Indonesia does not take into account household compositions and differences of needs at different stages of human life. More specifically, the definition does not recognise that children in various stages of life have unique needs.

The existing government measures need to be improved in the context of measuring child poverty. The poverty measures applied by the government of Indonesia focus only on household-level poverty. The measures also fail to take into consideration the variation in the needs among the household members. In particular, they do not distinguish the needs of children as individuals from the needs of adults.

There are knowledge gaps in the comparison of child poverty measures. In particular, the overlaps and discrepancies between different child poverty concepts and measures are not clearly defined. In addition, the best child poverty measures still need to be identified, and the extent and nature of child poverty needs further examination. The following list summarises the gaps in more detail:

- ***First,*** there is limited understanding of the agreement and differences between different child poverty concepts and measures. Although Hadiwidjaja et al. (2013), the World Bank (2015c), and Bima and Marlina (2017) have already analysed the overlap between monetary and some non-monetary indicators of child poverty in Indonesia, some knowledge gaps remain. For example, there has not been adequate discussion on the extent of the conceptual agreement and differences among the measures and how those influences the estimates (including the overlaps and discrepancies).
- ***Second***, evidence on what is the most appropriate child poverty measure for Indonesia does not exist. Child poverty studies have mainly focused on empirical analysis and comparison without adequate discussion about the quality and appropriateness of each measure. The information available to assess the appropriateness of each child poverty measure in Indonesia is inadequate; for example, there is limited information regarding the extent to which monetary and absolute deprivation measures are suitable for child poverty measures in the Indonesian context. In addition, the accuracy of different child poverty measures has never been compared. There is also no information on the strengths and weaknesses of the child poverty measures. While previous studies (Bima and Marlina, 2017; BPS, 2017a; Landiyanto, 2013; SMERU, 2011; UNICEF, 2017a) have measured the extent of child poverty, those studies have not performed any analysis to confirm whether the poverty measures used are reliable or valid. Additionally, the selection of thresholds in those studies used to identify which children are experiencing deprivation seems to be arbitrary.
- ***Third,*** the scope of comparisons is limited. The main approaches of comparisons in the previously cited studies are absolute deprivation (mainly human rights-based) and monetary poverty. Additionally, while

child poverty in Indonesia is measured based mainly on absolute poverty and deprivation, there is no evidence about how absolute poverty and deprivation compare with other measures such as relative deprivation.

- ***Fourth***, some child poverty measures are untested in the Indonesian context. For example, there is limited evidence of child poverty from the relative deprivation lens. As of the end of 2017, there had been no quantitative studies on Indonesia measuring child poverty based on relative deprivation. This gap may exist in large part because of one of the primary methods for the measurement of relative child poverty, namely the socially perceived necessities approach (Main, 2013; Main and Bradshaw, 2014), is not practically applicable for measuring child poverty in Indonesia since the existing data do not provide the required information. However, some attempts to capture people's views on child poverty have been conducted, such as the research by Bessell (2009), SMERU (2011), and Reality Check Approach Plus and UNICEF Indonesia (2017). In this case, an alternative strategy to measuring relative deprivation in Indonesia is required. The findings for the aforementioned studies could be used as an entry point for developing a quantitative child poverty measure based on relative deprivation.

Because of these gaps, poverty reduction policy and interventions have been developed and implemented based on insufficient or inappropriate evidence (Sumarto, 2016). Existing policy and interventions thus may be excluding poor children that could be identified by adequate evidence. Indeed, there are many cases of children who are considered as poor (i.e. from poor families) who have not received any social protection support (Bima et al., 2017; Rizky et al., 2017; SMERU, 2011; Sparrow, 2006)

CHAPTER 4. DATA AND METHODOLOGY

Chapter Summary

This chapter reports the data, data preparation and broad approach used to estimate child poverty in Indonesia.

- This thesis aims to investigate whether different child poverty measures report the extent and nature of child poverty differently.
- This thesis uses secondary analysis of existing data to compare different measures of child poverty. The measures selected were monetary, absolute deprivation, and relative deprivation.
- The available data for measurement of child poverty were IFLS, IFLS East and SUSENAS. The data that used by existing government measure are SUSENAS.
- The preferred data used for this thesis were IFLS 5 supplemented by IFLS East data because:
    - The data comprises both children and household indicators.
    - The data also incorporate monetary and non-monetary indicators
- To estimate poverty in all areas of Indonesia for 0-17 years old data were prepared and combined:
    - Data from children questionnaire and adult questionnaire were combined to develop 0-17 years data.
    - IFLS EAST Data were integrated into IFLS 5 Data to include the Eastern part of Indonesia into the estimates. Because data were collected three years apart expenditure data was adjusted for inflation.
    - Considering missing data, because missingness was not severe (<2% for all variables), and imputation risks was high, imputation was not used.
- The final sample was considered adequate because the sample size is large.
- Weighted estimates are preferred above unweighted estimates in this thesis because the sample characteristics are closer to the population reference.
- The development of monetary, absolute multidimensional and relative multidimensional measures of child poverty are reported in CHAPTER 5, CHAPTER 6, and CHAPTER 7 respectively.

4.1 Research Aims and Questions

The objective of this thesis is to compare different child poverty measures and investigate whether different child poverty measures report the extent and nature of child poverty differently, considering differences in the extent and nature of child poverty. The objective of this thesis was the foundation of the selection of the data and methodology. The research questions for the thesis, as set out in section 1.2, are as follows:

1. What are the sensible and possible ways to assess child poverty in Indonesia?
    a. What are the conceptually coherent approaches to the assessment of child poverty?
    b. What data are available and, therefore, which of the conceptually coherent approaches are possible?
    c. What indicators should be used to define and assess poverty according to each of these approaches?
2. How do estimates of child poverty in Indonesia vary between these different methods?
    d. What is the extent of child poverty identified by each method?
    e. What is the profile of child poverty identified by each method?
    f. How sensitive are the thresholds of each method?
3. How do these different methods characterise child poverty in Indonesia?
    a. Which children are included or excluded in each method?
    b. To what extent do poor children experience different types of poverty simultaneously?
    c. Which is the best approach to measuring child poverty in Indonesia, and why?

CHAPTER 2 considered the conceptually coherent approaches to the assessment of child poverty and settled on absolute monetary, relative monetary, absolute deprivation, and relative deprivation as the most useful measures to compare in this thesis. This chapter addresses research question 1b by establishing what data are available (see section 4.2.2) and then setting out the methods that can be used to address the remaining research questions.

4.2 Research Design

4.2.1 Secondary Analysis of Existing Data as a Research Strategy

This thesis used secondary analysis of existing quantitative survey data. According to Bryman (2008) and Creswell (2003), quantitative methods are appropriate for the estimation of the empirical situation of a particular population. The estimates can represent the population when the sample size is large enough and covers various groups of the population (Bryman, 2008; Donnellan et al., 2011).

However, collecting representative data to estimate child poverty requires a lot of resources. In particular, across a large country like Indonesia, significant financial resources, human resources, time, and expertise would all be required to collect primary data. For example, the cost for the regular data collection and processing of the Indonesian national socio-economic survey (SUSENAS) is about IDR 40,000,000,000 (2.8 million USD) per year (Kementerian Keuangan, 2016). Although this survey mainly uses the in-house human resources of Indonesia's central agency on statistics (*Badan Pusat Statistik –BPS*), the cost of the survey is still considerably high according to Indonesian standards.

Secondary analysis was therefore selected primarily because it is resource-effective. It allows for the analysis of nationally representative data with lower data-collection costs compared to primary data analysis (Boslaugh, 2007; Dale et al., 1988; Vartanian, 2010). Using secondary data that already exist also helps to save a great deal of time (Procter, 1993).

According to Donnellan et al. (2011), secondary analysis of public data also supports research transparency. Analyses can be replicated, which encourages careful analysis and reporting and exposes problems with analysis conduct (Dale et al., 1988; Donnellan et al., 2011). Additionally, Bryman (2008) and (Dale et al., 1988) point out that re-analysis of secondary analysis with different theoretical perspectives, methods, or point of views may offer new interpretations and lead to new conclusions.

The crucial factors in secondary analysis are the availability and accessibility of the secondary data. Secondary analysis should thus only be considered when

data are available that fit the research questions. Data access is discussed in more detail in section 4.2.2.

There are some potential disadvantages when using secondary analysis. A user of secondary data may not have adequate information about the data collection, including problems that occurred during the data collection (Donnellan et al., 2011) and knowledge of local context (Hammersley, 2009). Quality control during data collection is crucial, but this is out of the control of researchers using existing data (Boslaugh, 2007; Bryman, 2008; Vartanian, 2010). The quality of the data collected depends on the organisation or researcher that originally collected the data. Thus methodological problems or important contextual information may not be accounted for in the analysis.

Boslaugh (2007) argues that secondary analysis can get into trouble if the new research questions and the previously collected data do not have corresponding objectives and if the data are not designed to answer the research questions. Donnellan et al. (2011) states that large publicly available datasets may have impressive breadth but may not provide information in depth enough to examine any particular issues. In such situations, some key variables may be absent (Bryman, 2008). These issues must be considered carefully when selecting datasets and variables within datasets.

Despite the potential difficulties, the advantages of secondary analysis outweigh the disadvantages (Donnellan et al., 2011), where the data were collected with proper methodology (proper sampling design and data collection instrument) and documentation of data collection is adequate, the potential disadvantages above can be avoided. Additionally, there is greater acceptance of secondary data analysis in line with the increasing number of the availability of secondary data (Hofferth, 2005; McArt and McDougal, 1985; Safran et al., 2007). In Indonesia, the increasing use of secondary analysis are supported by open data movement where many agencies and organisation in Indonesia add their list of data that can be accessed by the public (Gunawan and Amalia, 2016; OECD, 2016a).

4.2.2 Selection of Data Sources

Selecting the data was an important stage of this thesis. Since this thesis focused on comparing different measures of child poverty, the data had to cover wide ranges of indicators to support the analysis of the investigated child poverty measures. The data also had to be accessible to be used in this thesis.

Measurement of child poverty requires specific sets of information. The required information depends on the types of measures that will be used. For example, monetary child poverty measures require monetary-related details such as information of income or expenditure, while deprivation measures require information such as possession of necessities.

There were three possible datasets available for analysing child poverty in Indonesia: The National Socio-economic Survey (SUSENAS), the Indonesian Demographic and Health Survey (IDHS), and the Indonesian Family Life Survey (IFLS).

SUSENAS is an official nationwide survey which captures the socio-economic situation of Indonesian society (BPS, 2015b; Sumarto et al., 2007). The SUSENAS data are regularly collected two times a year, every March and September, by Indonesia's statistics office (BPS, according to its Indonesian acronym). The March survey, which is the main survey, covers approximately 300,000 households and represents every district in Indonesia; the September survey is smaller, collecting data from approximately 75,000 households and representing every province in Indonesia (BPS, 2015b).

The Indonesian Demographic and Health Survey (IDHS) is part of a multi-country survey effort and is also executed by the BPS. It was collected a few times in 1987, 1991, 1994, 1997, 2002, 2007, 2012, and 2017 (DHS Program, 2018b).

The third dataset comes from the IFLS, a longitudinal survey that covers the socioeconomic situation of Indonesian society across time (RAND, 2016a; b; Strauss et al., 2004; Strauss et al., 2016a; b). The Indonesian Family Life Survey (IFLS) was collected in five waves: IFLS 1 in 1993/1994, IFLS 2 in 1997/1998, IFLS 3 in 2000/2001, IFLS 4 in 2007/2008, and IFLS 5 in 2014/2015 (Strauss et al., 2016a). The first wave of the IFLS, the IFLS 1, is the basis of the sampling frame; additional panel members were recruited at each wave (Strauss et al.,

2016a). Furthermore, because the IFLS mainly covers western and central parts of Indonesia, a special IFLS called the Indonesian Family Life Survey for Eastern Indonesia (IFLS East) was conducted in the eastern part of Indonesia (Satriawan et al., 2014; Sikoki et al., 2013; Survey Meter, 2013).

To select the appropriate dataset for this thesis, the data were compared to understand the coverage of these datasets. The main criterion to select the data was the inclusion of both monetary and non-monetary information. The IDHS is robust regarding non-monetary indicators, especially related to demography and health, but information regarding income and expenditure is not collected. SUSENAS has very comprehensive expenditure information to support monetary poverty assessments such as expenditure and assets as well as basic demographic information. The IFLS includes a greater range of indicators than the other surveys, covering expenditure, assets, income, necessities, and also several demographic and health indicators.

Most of the information covered by the datasets is at the household, not individual child, level. Thus, these datasets all provide only limited information at the level of individual children within households. Among the three datasets, the IFLS provides the most comprehensive individual level information, including a special set of questions on children. The IFLS also offers information at different levels of the data hierarchy, including information at the community and household levels and at the individual level.

Among the three datasets, the IFLS is the least representative. The IFLS has a smaller sample size compared to the IDHS (DHS Program, 2018a) and SUSENAS (BPS, 2015b). The IDHS and SUSENAS cover all Indonesian provinces, but the IFLS excludes many provinces, particularly those in the East, and covers only 83% of the national population (RAND, 2016a; b). For example, the IFLS excludes provinces in eastern Indonesia because of the high cost of survey data collection in those areas. It also omits some provinces from non-Java major islands (Sumatera, Kalimantan, and Sulawesi), again because of budget limitations. Additionally, the Aceh province is excluded because during the design and early implementation of the IFLS, it was a conflict area (Strauss et al., 2016a).

Excluding eastern Indonesia from the analysis would lead to an underestimation of the extent of child poverty. As discussed in CHAPTER 3, Eastern Indonesia is

lagging behind in various sectors, in health, education, and infrastructure, especially compared to the western part of Indonesia, and has larger numbers of people living in poverty. However, in 2011 and 2012, the Indonesian Family Life Survey for Eastern Indonesia (IFLS East) was conducted to supplement the IFLS. The surveys have almost identical questions and cover similar information and have similar sampling strategies. Harmonising these datasets to create an Indonesia-wide sample is therefore possible (see section 4.4 for details).

The latest wave of the Indonesian Family File Survey (IFLS), IFLS 5, combined with the IFLS East, were selected as the best data sources for this thesis because together they have the greatest coverage across income, expenditure, resources, and necessities, because they provide individual-level information for children within households, and because they link with community-level information useful for understanding community resources.

4.3 Research Ethics and Permissions to Access Data

When using secondary data, ethical issues must still be considered. According to Creswell (2003), ethical issues may occur during data collection, when accessing the data, and also in data analysis. Morrow (Morrow, 2009; 2013) points out that a common ethical issue in data collection concerns obtaining permission from respondents. According to their survey manuals and tools (Sikoki et al., 2013; Strauss et al., 2016a; b), the enumerators of IFLS 5 and IFLS East should have informed the respondents that their confidentiality and anonymity would be protected. In practice, there is no information on the extent to which the enumerators informed the respondents accordingly. However, confidentiality and anonymity were protected, as evidenced by the dataset itself.

The IFLS and IFLS East collect data only from respondents who are willing to participate and give consent, and the data are recorded anonymously. The only information that can be used to distinguish between different respondents is the anonymous ID (a numeric code) of households and individuals. For each respondent, there is information regarding their consent and whether they finished the interview in the dataset. There is no further data available for respondents who refused to participate in the survey.

In the context of accessing data, it is unethical to distribute data to other people without participants' permission (Creswell, 2003). Both the IFLS 5 and the IFLS East are open datasets that can be accessed freely by the public with permission from the data owners. The IFLS 5 (and the other waves of the IFLS) can be accessed via the Website of the RAND Corporation. Both the IFLS 5 and the IFLS East can be downloaded following completion of an online registration form and receipt of permission from the RAND Corporation (IFLS5) and Survey METER (IFLS East). No specific conditions or eligibility are required to download the data. Therefore, there should be no ethical issues in accessing the dataset. However, the data download mechanism suggested that every data user request to data directly owner and not distribute the data to public. The illustration of registration and permission to download the data can be seen in Appendix B.

Additionally, consistent with Creswell (2003), who pointed out the importance of protecting anonymity, the IFLS 5 and the IFLS East protect the anonymity of respondents and community names. Only district- and province-level identifiers (names) are provided. It was therefore impossible to identify individuals from the data provided. Indonesian provinces have a population between 600,000 and 30,000,000 inhabitants. District-level areas, which are part of the provinces, have populations between 20,000 and 3,000,000 inhabitants. Other information, such as community-level information, is reported by codes; as no codebooks of community names are available, it was also impossible to link to these codes to the name or location of the community. Researchers cannot, therefore, identify which village or sub-district the data are from. No individual names, addresses, or other identifiers are included in these datasets.

This thesis was reviewed and approved by the University of Bristol's School for Policy Studies Research Ethics Committee. The application and confirmation of approval are included in Appendix C.

4.4 Using the IFLS Datasets

4.4.1 Description of IFLS & ILFS East Design and Conduct

The most recent wave of data was selected (IFLS5). The IFLS 5 (and other waves of the IFLS) were collected by the RAND Corporation in collaboration with local institutes in Indonesia (Strauss et al., 2016a; b). The IFLS 5 was conducted between September 2014 and March 2015 (Strauss et al., 2016a).

As part of the multi-wave survey, the IFLS 5 was designed to link and have some level of consistency with the original design of the IFLS. Therefore, the sampling of the IFLS 5 was similar to the sampling originally designed for the IFLS 1 (the first IFLS). The sampling strategy of the IFLS 1 is stratified sampling following the stages described below:

1. Since the IFLS 1 was conducted slightly after SUSENAS 1993 and SUSENAS is one of the most representative surveys for the period, the IFLS 1 used SUSENAS 1993 as the sampling frame to identify the survey location and target sample. The IFLS 1 identified the enumeration area based on urban and rural areas as defined in SUSENAS (Gertler et al., 1993).
2. Using SUSENAS's list of enumeration areas, the IFLS 1 randomly selected 321 enumeration areas (EAs) from all the EAs in the included provinces. Urban areas were oversampled by almost doubling the sampled EAs in urban areas to reduce transportation cost. A small province in Java (Jogjakarta) and several provinces outside Java were also oversampled by at least two times (and up to four times) to capture an adequate sample for small provinces and also to allow Java and outside Java comparison (Gertler et al., 1993).
3. Using SUSENAS's list of the households in the EAs, the IFLS 1 randomly selected 20 households in each urban EA and selected 30 households in each rural EA. The IFLS followed the standard of the Indonesian statistics office's (BPS) definition, which states that a household is a group of people whose members reside in the same dwelling and share food from the same cooking pot (Gertler et al., 1993).

The IFLS 5 expanded this sample. In addition to covering the main respondents of the IFLS 1, the IFLS 5 expanded the sample coverage by using the following sample criteria (Strauss et al., 2016a):

- Household members born before 1968 who were interviewed in the IFLS 1
- IFLS 1 household members who were born between 1968 and 1988 if they were interviewed in the IFLS 4
- 20% random sample of IFLS 1 household members who were born between 1968 and 1988 if they were not interviewed in the IFLS 4
- Individuals born after 1988 if they were residents in an origin IFLS 1 household
- Individuals born since 1993 in origin IFLS 1 households or in split-off households if the individuals were children of IFLS 1 household members

Because of the expansion, the sample size of the IFLS 5 is larger than that of the IFLS 1. While 7,224 households were interviewed in the IFLS 1, the IFLS 5 included 16,204 households and 58,337 individuals within those households.

Considering that the IFLS 5 and the IFLS 1 were conducted in different periods, the population reference for weighting had to be changed. In the 1990s, the population of Indonesia was about 190 million. In 2014, the population was about 250 million (BPS, 2016a). Therefore, the sampling weight of the IFLS 5 was updated using 2014 SUSENAS data (Strauss et al., 2016b).

On the other hand, the IFLS East was collected by SurveyMETER in collaboration with National team for acceleration of poverty reduction (Satriawan et al., 2014; Sikoki et al., 2013). The IFLS East used a similar sampling approach (Satriawan et al., 2014; Sikoki et al., 2013). Included provinces were Nusa Tenggara Timur, Kalimantan Timur, Sulawesi Tenggara, Maluku, Maluku Utara, Papua Barat, and Papua. The IFLS East also used SUSENAS-classified urban and rural enumerator areas (EAs). It randomly selected households in each EA, with 20 households in urban EAs and 30 in rural EAs (Satriawan et al., 2014; Sikoki et al., 2013).

The combination of the IFLS 5 and the IFLS East covers the majority of Indonesian provinces. However, some provinces are not covered because they were not included in the initial design of the IFLS; excluded provinces include Aceh, Riau, Jambi, Bengkulu, Bangka Belitung, Sulawesi Utara, and Sulawesi Tengah. Despite the exclusion of those provinces, the combination between the IFLS 5 and the IFLS East has better coverage of Indonesia compared to the IFLS 5 alone. Based on the population distribution, the combination of the two surveys represents 88% of the Indonesian population; in comparison, the IFLS 5 alone represents 83% of the population.

4.4.1.1 Using the IFLS East as a Supplement to the IFLS 5

Due to differences in time, in data collection, and in sampling, some adjustments were required before merging the IFLS 5 and IFLS East data. The reasons for adjustments were as follows:

1) Data were collected 2 years apart, and therefore the population and economic situation at data collection were not the same. The IFLS 5 was carried out in 2014, and the IFLS East was carried out in 2012 (RAND, 2016a). This has particular relevance for monetary indicators because of inflationary effects on income and spending.
2) Although both surveys are based on SUSENAS, they used different periods of SUSENAS data as sampling frames and population references for weighting. The IFLS 5 used SUSENAS 2014 while the IFLS East used SUSENAS 2010.

Responding to these differences, in order to merge the IFLS 5 and the IFLS East, it was necessary to standardise the cross-section weight and consider inflationary effects.

The weight of the IFLS East needed to be recalculated based on SUSENAS 2014 as the population reference used for the IFLS 5 weighting. This recalculation responded to the population change over the period. Using an urban and rural comparison as an illustration, Table 4-1 shows that that the sample characteristics of IFLS East data (both weighted and unweighted) do not reflect the 2014 population. The weighted IFLS 5 sample is a closer match. But by reweighting the IFLS East and merging the reweighted dataset with IFLS 5, a weighted sample of combination of IFLS 5 and IFLS East (henceforth referred to

as IFLS+) is produced that is a close match to the 2014 population estimate based on SUSENAS. The IFLS+ dataset, IFLS 5 with amended weighting of the IFLS East data, is used for all analyses in this thesis.

Table 4-1. Comparison of urban and rural population based on Census 2010, SUSENAS 2014, IFLS 5, IFLS East, and IFLS+ (%).

	Urban	Rural
Proportion of households by urban and rural (IFLS East, Unweighted)	29.72	71.28
Proportion of households by urban and rural (IFLS East, Weighted)	31.74	68.27
Proportion of households by urban and rural (IFLS 5, Unweighted)	59.87	40.13
Proportion of households by urban and rural (IFLS 5, Weighted)	52.87	42.13
Proportion of households by urban and rural (IFLS+, Unweighted)	55.51	44.59
Proportion of households by urban and rural (IFLS+, Weighted)	50.94	49.06
Proportion of population by urban and rural (all provinces in Indonesia based on Census 2010)	49.79	50.21
Proportion of households by urban and rural (all provinces in Indonesia based on SUSENAS 2014)	49.84	50.16

No significant socio-economic shock occurred in Indonesia between the data collection periods of IFLS 5 and IFLS East, but because of inflation, real value of monetary indicators such as expenditures still differed during those periods. Therefore, indicator-specific standardisation was needed to deal with time differences. Inspired by the method used to standardise the monetary indicators in previous waves of the IFLS (Bah, 2014; Strauss et al., 2004), expenditure in the IFLS East was adjusted for inflation. The expenditure of the IFLS East was multiplied by the inflation rates between the end of 2012 (IFLS East data collecting period) and March 2015 (the final full month of data collection for the IFLS 5). The inflation rates were computed using the consumer price index from the BPS for urban areas (BPS, 2015a) and the farmer term of trade index for rural areas (BPS, 2015c).

4.4.1.2 Age Coverage in IFLS Questionnaires

The IFLS+ dataset is based on questionnaires that collected data across households, individuals, communities, and public facilities. Only the individual questionnaires included age-specific questions, and then only for two different age groups: adults and children. Adult questionnaires were used for those 15 years and older, and children questionnaires were used for those younger than

15 years. This age break does not correspond to the officially recognised age of childhood in Indonesia (those less than 18 years). Therefore, including only 'child' questionnaires would have excluded 16- and 17-year-olds from the analysis. As a solution, the responses regarding children aged 16 to 17 years old were identified from among the adult survey responses and added to the data for children. This means some items were missing for all individuals 16 to 17 years old, and this limitation is discussed in sections 6.1.1 and 7.1.1 which discuss selection of indicators.

4.4.1.3 Selecting the Observed Samples of Households and Children

The coverage of variables was used to select the observed samples. There are 16,204 households in the IFLS 5 roster (Strauss et al., 2016a) and 2,547 households in the IFLS East (Satriawan et al., 2014). Households unwilling to participate in the interview, unable to cover both monetary and deprivation indicators (only cover one of them), and without any members aged less than 18 years were dropped from the sample. Each observed household was considered as having 'matched variables' when its monetary and non-monetary variables aligned. Those households were also considered as having 'matched children' when they had children and their identifier matched with the children data.

Table 4-2 shows the original and retained samples. In total, 21,396 children were included in the analyses. Referring to the minimum sample standards for testing to select indicators and also for developing a composite index that ranges from 100 to 1000 (Anthoine et al., 2014; Martin and Martin, 2017; OECD, 2008; Rouquette and Falissard, 2011), the IFLS+ sample satisfies the minimum sample required for analysis.

Table 4-2. Comparing Original and Observed Samples

	IFLS+	IFLS 5	IFLS East
Original Households in the Rosters	18,751	16,204	2,547
Households willing to participate in the survey and having data that cover both monetary and deprivation (matched variables)	17,591	15,044	2,547
Households with matched variables that have children (matched children)	13,192	11,195	1,997
Number of observed children (less than 18 years old) from the matched households	21,396	16,712	4,675

Note: The IFLS East only recorded households that participated in the survey. All of the observed households in the IFLS East cover both monetary and deprivation.

4.4.2 **Characteristics of Observed Sample**

Table 4-3 describes the characteristics of the households and children included in the IFLS+ dataset and allow comparison of the weighted and unweighted sample. For example, weighting addresses the under-representation of children living on Java Island that provide closer figure to the real situation (39.37% unweighted, 55.21% weighted).

Table 4-3. Characteristics of IFLS+ Observed Households and Child Samples

		Unweighted				Weighted			
		Number of HH with children	% of HH	Number of children	% of children	Number of HH with children	% of HH	Number of children	% of children
Sex of the children	Male	-	-	10969	51.27	-	-	11003	51.43
	Female	-	-	10427	48.73	-	-	10393	48.57
Age group of the children	0-4	-	-	7000	32.72	-	-	6570	30.71
	5-6	-	-	2676	12.51	-	-	2627	12.28
	7-12	-	-	7124	33.30	-	-	7385	34.52
	13-15	-	-	3035	14.18	-	-	3170	14.81
	16-17	-	-	1561	7.30	-	-	1644	7.68
Education level of household head	No schooling or primary dropout	583	4.42	865	4.04	623	4.72	935	4.37
	Primary school	4622	35.04	7570	35.38	5055	38.32	8417	39.34
	Junior high school	2481	18.81	3988	18.64	2416	18.31	3808	17.80
	Senior high schools	3896	29.53	6355	29.70	3608	27.35	5792	27.07
	University	1542	11.69	2540	11.87	1422	10.78	2366	11.06
Sex of household head	Male	11329	85.88	18836	88.04	11261	85.36	18642	87.13
	Female	1863	14.12	2560	11.96	1931	14.64	2754	12.87
Religious affiliation of household head	Other religions	1994	15.12	4035	18.86	1563	11.85	3325	15.54
	Islam	11198	84.88	17361	81.14	11629	88.15	18071	84.46
Occupations of household head	Not Working or without paid	2481	18.81	3280	15.33	2603	19.73	3626	16.95
	Working for getting income	10706	81.16	18105	84.62	10584	80.23	17759	83.00

		Unweighted				Weighted			
		Number of HH with children	% of HH	Number of children	% of children	Number of HH with children	% of HH	Number of children	% of children
Value of household assets (quintile range in Indonesian million Rp.)	Highest	2640	20.01	3566	16.67	2599	19.70	4118	19.24
	Higher	2638	20.00	4316	20.17	2567	19.46	4411	20.61
	Medium	2639	20.00	4551	21.27	2754	20.88	4539	21.21
	Lower	2643	20.03	4483	20.95	2727	20.67	4231	19.77
	Lowest	2632	19.95	4480	20.94	2544	19.29	4099	19.16
Areas	Urban	7055	53.48	10901	50.95	6720	50.94	10677	49.90
	Rural	6137	46.52	10495	49.05	6472	49.06	10719	50.10
Islands	Java	6078	46.07	8423	39.37	8117	61.53	11813	55.21
	Outside of Java	7114	53.93	12973	60.63	5075	38.47	9583	44.79
Total		13192	100.00	21396	100.00	13192	100.00	21396	100.00

4.4.3 Dealing with Non-response and Missing Data

Missing data is a typical issue in large scale surveys including the IFLS 5 and the IFLS East. These two surveys both have very complex structures and cover many questions. Data can be missing because of refusal to participate in the surveys, failure to record responses, or errors with data entry and non-responses to certain items. The sample only includes those who consented to being in the survey, and the data underwent some preliminary cleaning processes by RAND (Strauss et al., 2016a; b) and Survey Meters (Sikoki et al., 2013), so most of the failures to record responses and data entry error were treated before the data were published for the public. The respondents who refused had already been excluded. Therefore, some of the same data are available for every case. However, individual survey items may still be missed (Sikoki et al., 2013; Strauss et al., 2016a; b). Data are also missing because of unmatched identifiers, for example, when household IDs are missing or unmatched to individual survey data. These types of missing data were random occurrences and not considered as issues. When there was an unmatched identifier, the unmatched cases were removed, and pair-wise deletion was applied to deal with the missing data.

Non-responses to certain items could have been more problematic, particularly when using derived variables, because if the missing data were not random, excluding non-responders could bias the sample. Imputation is often used to generate artificial data to avoid this problem. However, current strategies for imputation such as the multiple imputations can be problematic when dealing with missing categorical data such as dummy variables (Cranmer and Gill, 2013; Sterne et al., 2009). The specific methods of imputation for categorical data (the bulk of the data used here) are applicable, but there is no general agreement on strategies to deal with this type of missing data (Allison, 2005; Cranmer and Gill, 2013; Hakan, 2009; Siddique et al., 2014; Subasi et al., 2011; Vermunt et al., 2008). The strategies are experimental, involve complex methodology, and work only in limited situations under certain assumptions (Allison, 2005; Cranmer and Gill, 2013; Hakan, 2009; Siddique et al., 2014; Subasi et al., 2011; Vermunt et al., 2008); for example, linear imputation will work only if the average score of the dummy variable is around 0.5. An average value of the dummy variable near 0 or 1 culminates in imputation bias (Allison, 2005).

The OECD (2008) suggests that some adjustments for missing data may be necessary when there is a significant amount of missing data. In this case, analysis of the IFLS+ data showed that no items had (missing data is less than 2% in corresponding items), and most items had no missing (see Table D-1 for more detail). Given the complexity of imputation of categorical variables and the low rate of missingness in this type of items, no attempt was made to impute.

4.5 Analysis Strategy: Measurement of Child Poverty

To measure child poverty using monetary and deprivation-based estimates (absolute and relative deprivation), each measure was defined and calculated. This process involved identification and aggregation of data. Identification focused on identifying the poverty indicators. Aggregation considered the thresholds of each indicator, and whether they should be combined to understand the overlap or analysed separately (Alkire and Foster, 2011b; Ferreira, 2011; Ferreira and Lugo, 2013; Ravallion, 2011). After aggregation, the poverty threshold was defined to distinguish poor and non-poor (Alkire and Roche, 2012; Corak, 2006; Gordon and Nandy, 2012). The number and characteristics of children living in poverty was then be calculated and described. Although the stages were similar for both the monetary- and deprivation-based estimates, the detailed methods varied between child poverty measures.

The identification and aggregation of indicators, the definition of the poverty threshold, and the empirical analysis of poverty among children are presented and discussed in CHAPTER 5 (monetary analysis), CHAPTER 6 (absolute deprivation), and CHAPTER 7 (relative deprivation). These chapters together present the detailed methods and the analysis results of each child poverty measurement.

CHAPTER 5, CHAPTER 6, and CHAPTER 7 also compared the child poverty rates to investigate subgroup disparities according to individual, household, and geographical characteristics. The individual characteristics are the sex and age of the children. The selected household characteristics are the highest level of education, the sex, the religion, and the occupation of the head of the household and the quintile of the household assets. The geographic characteristics focus on

spatial dichotomy covering types of area (urban and rural) and islands (Java and outside Java). While the focus of these three chapters was on understanding the characteristics of poor children, the characteristics of non-poor children may be worth presenting in future research as a benchmark to provide more meaning to the empirical observations.

Furthermore, an overlaps analysis was implemented to analyse the extent to which poor children experience different types of poverty simultaneously and to identify the children who are excluded and included by each method. CHAPTER 8 carries out a sensitivity and specificity analysis to compare the accuracy of the measures and support the identification of the best measures in Indonesia.

CHAPTER 5. MONETARY CHILD POVERTY

Chapter Summary

This chapter reports estimated monetary child poverty in Indonesia from absolute and relative monetary perspectives along with the individual, household, and geographical characteristics of the children living in monetary poverty.

- The analysis reported in this chapter compared monetary child poverty based on absolute and relative poverty.
    - Absolute poverty was defined using the Statistics Indonesia (BPS) poverty line.
    - Relative poverty was defined using the 60% national and 60% provincial median.
    - The analysis applied equivalence scale in both absolute and relative monetary child poverty.
    - As a benchmark, the analysis also applied a per capita measure of the BPS poverty line.
- The proportion of poor children in relative monetary poverty was higher than the proportion in absolute monetary poverty.
    - In the context of absolute poverty, the poverty estimates between per capita (10.57%) and equivalised BPS poverty measures (10.43%) were close.
    - However, there were some levels of differences among relative poverty between the 60% national (33.33%) and provincial median (29.53%).
- The disparities according to education, religion of head of household, households' assets, and geographic location were evident for almost all measures, which is consistent with the result of the logistic regression. However, the disparities that were visible in the provincial-based poverty line (60% provincial median) were not always consistent with the other measures.
- The absolute poverty (per capita and equivalised BPS poverty lines) was preferred above relative poverty because it provided comparable results across provinces, while at the same time acknowledging price variation across the region.
- Among the two absolute poverty lines, the equivalised BPS poverty line was conceptually better because the use of the equivalised scale acknowledges household composition.

5.1 Monetary Child Poverty Measure

Four steps have been taken to measure and compare absolute and relative monetary poverty levels for children in Indonesia. The first step identified the monetary indicators, which are mainly expenditure indicators, to be used for the further steps, and the second step calculated total household expenditure. The third step was a disaggregation of the expenditure from household to individual, and, finally, the fourth step was the identification of the poverty threshold (Corak, 2006).

The empirical analysis investigated child poverty using both absolute and relative poverty measures and then considered the consistency among those measures. The poverty rates based on absolute poverty thresholds were compared with the poverty rates based on relative poverty thresholds to inform the estimates of the proportion of poor children and of poor households. The overlaps and discrepancies between absolute and relative child poverty were investigated. Then the disparities of child poverty and also poverty among households were explored based on the comparisons of poverty rates according to different types of geographic conditions and household characteristics. The poverty rates would be supported by the analysis of the depth and severity of child poverty based on the subgroup comparisons of the characteristics. The comparisons were confirmed using analysis of variance (ANOVA). To conclude the estimation, a robustness test and also a non-parametric analysis using logistic regression were carried out to confirm the characteristics of poor children.

5.1.1 Robustness and Statistical Inferences

The robustness check is one of the important features of this chapter. According to Haughton and Khandker (2009), there four potential challenges related to ensuring the robustness of monetary poverty measures. The first challenge is related to sampling. The second is related to measurement issues such as under-reporting and missing data. The third is related to differences in needs among the household members because of their heterogeneity, for example, heterogeneity based on age and sex. The fourth is about the selection of the poverty threshold.

This chapter mainly focuses on the heterogeneity of household members and poverty because sampling and measurement issues were already discussed in CHAPTER 4. Subsection 5.1.2.2 covers the robustness issues related to the

heterogeneity of household members. The robustness issues related to the poverty threshold would be discussed in section 5.1.3 and again in more detail in section 5.2.5. The contexts of robustness of poverty threshold included not only selecting an appropriate poverty threshold but also determining the robustness of the sub-group comparison.

Furthermore, this chapter analyses the profile of the poor households and children. The investigation focuses on households that have children as the unit of analysis at the household level. The data indicate that only 73% of all households have children.

5.1.2 Monetary Child Poverty Indicators

During the selection of the monetary indicators, an important decision was made about whether this thesis should use income or consumption. As discussed in CHAPTER 2, consumption was the most appropriate indicator and hence selected as the monetary measurement indicator in this thesis.

Echoing Haughton and Khandker (2009), this thesis recognises that consumption not only covers goods and services that are purchased but also self-made goods and services that are produced and consumed by the household.

Many guidelines (BPS, 2018b; Cahyat, 2004; Coudouel et al., 2002; Haughton and Khandker, 2009; Maksum, 2004; Priebe, 2014; Rio Group, 2006) have suggested household expenditure as a proxy indicator to operationalise consumption measures. However, since expenditure mainly reflects goods and services purchased, an analysis of expenditure as the proxy of consumption needs to be conducted carefully. In urban areas, subsistence agriculture and self-made production may incorporate small proportions of household production. But in rural areas, they may represent a significant contribution to household consumption.

Fortunately, the available data provide the required information. The Indonesian Family Life Survey Plus (IFLS+) dataset (a combination of both the IFLS 5 and the IFLS East) encompass a wide range of consumption items. Furthermore, the IFLS+ distinguishes between the consumption of self-made products and the transfer of those products from and to other people. Therefore, the estimation of

household expenditure also recognises self-made products and the transfer of those products from and to other people.

5.1.2.1 Calculating Household Expenditure

The total household expenditure should be calculated based on all expenditure items. The process of calculating household expenditure involves identification of the expenditure items, standardising those expenditure items, and aggregating the expenditure items. However, questions arose as to whether this thesis should aggregate all the expenditure items or exclude some of them.

The expenditure items incorporated food and non-food expenditures. As discussed in CHAPTER 2, monetary poverty measures emphasise basic needs; these measures thus recognise not only food expenditure but also non-food expenditure (Haughton and Khandker, 2009; Ravallion, 1992; 2016). When the concept of needs is expanded beyond basic needs, items within the food and non-food expenditure categories also expand (Townsend, 1979). Referring to Survey Meter (2013), Sikoki et al. (2013), Satriawan et al. (2014), RAND (2016b), and RAND (2016a), the list of included consumption items in the IFLS+ dataset and the observation periods can be seen in Table 5-1**.** For more detail, corresponding data sources of those items can be consulted on Table E-1 of Appendix E.

Table 5-1. Expenditure Items available in IFLS+ dataset

Category	Expenditure Items	Reporting Periods
Food (amount purchased/ spent on food and estimated value of both self-produced food and food received from other sources)	Staple foods	Since last week
	Non-staple foods • Vegetables • Dried foods • Meat and fish • Milk/eggs • Spices • Beverages and other drinks/consumer products	Since last week
	Estimated value of food items provided to other people	Since last week
Non-Food (amount purchased/ spent on items and estimated value of both self-made items and items received from other sources)	Housing • Rental cost (if renting house) • Estimated rental cost willing to pay (if living in an owned house)	Since last year
	Transport	Since last month
	Health costs	Since last year
	Education costs	Since last year
	Energy and utilities • Electricity • Fuel • Water	Since last month
	Communication	Since last month
	Leisure	Since last month
	Household's small items and personal toiletries	Since last month
	Domestic services and servants' wages	Since last month
	Revolving savings (Arisan)	Since last month
	Lottery and gambling	Since last month
	Household supplies and furniture	Since last year
	Clothing	Since last year
	Taxes	Since last year
	Ritual ceremonies, charities, and gifts	Since last year
	Other expenditures not specified above	Since last month
	Estimated value of non-food items provided to other people	Since last month

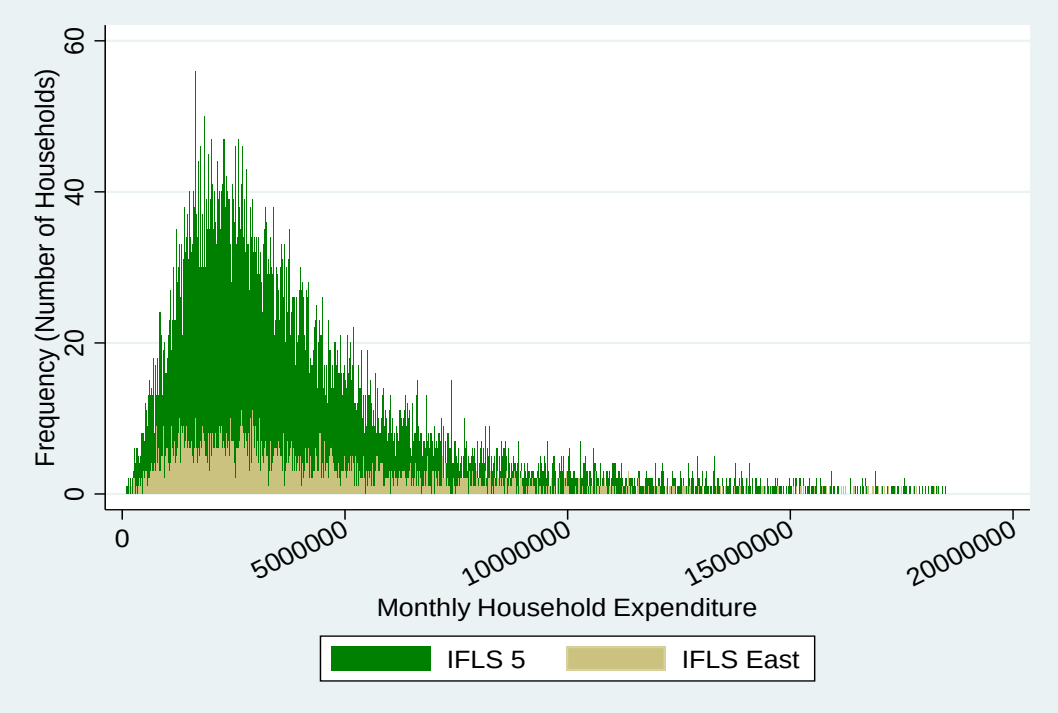
Due to the data availability, the expenditure items in Table 5-1 heavily emphasise expenditure on basic necessities such as foods, housing, transport, health, education, utilities, and communication. The table seems to neglect luxuries and other products that are not regularly consumed. However, the emphasis on basic necessities is considered to make sense because the households being studied

do not routinely spend money to consume luxuries like jewels or durable goods such as cars or televisions.

Since there was a variation in the observation periods for expenditure items, these items had to be standardised to monthly expenditure. The expenditure variables were transformed using monthly expenditure standards. It was assumed that the last week's consumption reflected routine weekly consumption. This assumption allowed the computing of monthly expenditure. It was also assumed that the households had an equal pattern of consumption every month; this assumption allowed transformation of yearly expenditure into monthly expenditure.

After the standardisation, the variations in the monthly household expenditure indicator were visible in both the IFLS 5 and the IFLS East. The histogram shown in *Figure 5-1* shows the unweighted frequency distribution of monthly household expenditure in both datasets.

Figure 5-1. Frequency Distribution Histogram of Households Expenditures based on data sources



The frequency distribution graph shown in *Figure 5-1* shows that the IFLS 5 and IFLS East datasets share a similar pattern of distribution, with the majority of

households for both in the lower band of expenditures and very few households in the higher band of expenditures. The frequency of the IFLS 5 is higher than that of the IFLS East because the IFLS 5 has a larger sample size. However, the frequencies for both the IFLS 5 and the IFLS East peak in a similar range of expenditure, which provides grounds for integrating the IFLS East into the IFLS 5.

The left-skewed distribution is normal for expenditure data and indicates an unequal society where most of the population have relatively low and middle-level expenditure.

5.1.2.2 Disaggregation of Household Expenditure to Estimate Expenditure for Children

The expenditures of children were estimated from disaggregation of household expenditures. As mentioned in CHAPTER 2, per capita approach and equivalence scales can be used to obtain information on child expenditure. Per capita approach is a common estimate of the expenditure of individual household members. The estimate is computed by simply dividing household expenditures by the number of household members (Haughton and Khandker, 2009; Ravallion, 1992; 2016). However, it should be acknowledged that every household has different size and composition of household members. Therefore, equivalence scales are considered as better measures than the per capita approach from a theoretical perspective because equivalence scales acknowledge household size and composition (Cockburn et al., 2009; White and Masset, 2002). The adult equivalent is also often used as a unit of measurement for monetary poverty correspondent to household compositions (Deaton and Muellbauer, 1986; Deaton and Zaidi, 2002; Gray, 2013).

Many disagreements surround which equivalent scales should be used. One widely used equivalence scale is the Organisation for Economic Co-operation and Development's (OECD) standard. However, the OECD equivalence scales may not be appropriate for Indonesia, a non-OECD member whose data were not included during the development of the equivalence scale. On the other hand, some attempts have been made to estimate an equivalence scale in the Indonesian context, such as those conducted by Deaton and Muellbauer (1986),

de Ree et al. (2013), Olken (2005), Pokhrel (1995), and Priebe (2016). However, some of these researchers have focused on economies of scale in the household without significantly considering age and gender (de Ree et al., 2013; Olken, 2005), while most of the others have focused on gender and age, but without significantly considering economies of scale (Deaton and Muellbauer, 1986; Priebe, 2016). Only one of the studies has focused on economies scale, gender, and age together (Pokhrel, 1995).

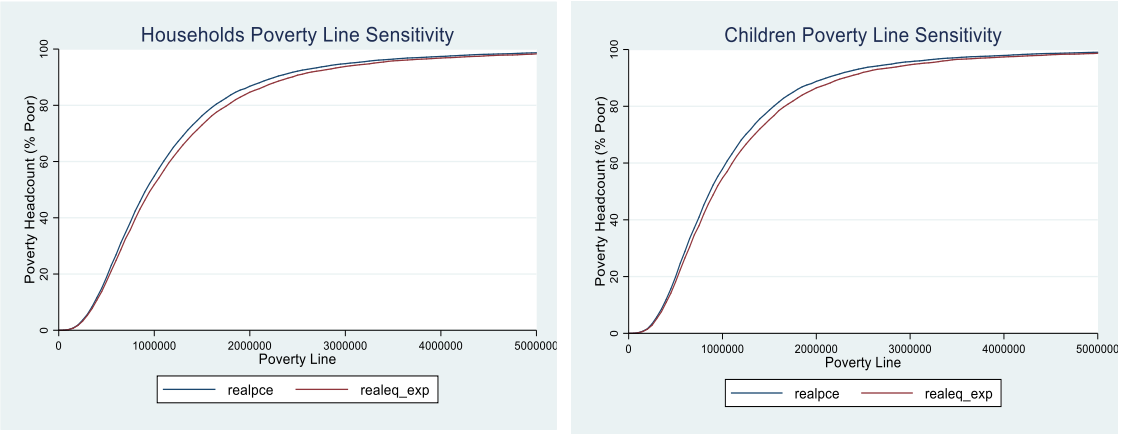
Therefore, the empirical analysis used the equivalence scales recommended by Pokhrel (1995), as these scales take economic scales, gender, and age group into consideration. Pokhrel (1995) found that children consume less than adults, and female children consume more than male children. He estimated that the cost of a child 0-6 years old, either male or female, is 95% of the cost of an adult; the cost of a male child 7-15 years old is 92% that of an adult; and the cost of a female child 7-15 years old is 97% that of an adult.

As a basis for the analysis, the use of equivalence scales was compared with the use of per capita approach. Although equivalence scales are considered as theoretically the best option, the common standard for estimating individual expenditure in Indonesia is per capita expenditure. Therefore, per capita approach was also applied. Sensitivity of the poverty was used to compared equivalised and per capita expenditure.

Sensitivity of the poverty line indicates change in the proportions of the poor according to change in the thresholds. Differences in poverty thresholds' sensitivity between equivalence scale and per capita expenditure are expected because costs in the equivalence scale approach were influenced by the different characteristics of household members. Equivalence scales are different from per capita approach, as the latter assumes that every household member has an equal share of costs among household members. The Wilcoxon matched-pairs signed-ranks test confirmed that there is a statistical difference between per capita expenditure and equivalised expenditure at a level of 0.001.

More robust comparisons between equivalence scale and per capita expenditure can be seen in *Figure 5-2*. Comparing households and children, *Figure 5-2* shows the sensitivity poverty thresholds according to per capita expenditure and adult equivalence expenditure.

Figure 5-2. Comparison between Per capita and Equivalent Expenditures



Note:
realpce= real value of percapita expenditure.
realeq_exp=real value of equivalised expenditure

In general, *Figure 5-2* demonstrates that at the same level of the poverty threshold, there are higher proportions of the poor households according to the per capita expenditure compared to the equivalence expenditure. The graph also demonstrates the consistency across different poverty thresholds, highlighting that per capita expenditure has a higher proportion of the poor households than the equivalence scale. However, further statistical checks of dominance using the "dompov" command in DASP package (Araar and Duclos, 2013) report that there are intersections between sensitivity graphs of per capita and equivalised expenditure, especially in the lower-left side and upper-right side of the graphs. The intersections indicate that there are similar proportions of poverty prevalence between per capita and equivalised expenditure in lower- and higher-level poverty thresholds. But in general, there are more poor children estimated based on per capita expenditure.

So to return to the question of whether to use per capita expenditure or equivalence expenditure for measuring monetary child poverty, equivalence expenditure means are more robust than per capita. This is because using equivalence expenditure entails acknowledging household characteristics and the economies of scale. The empirical analysis hence used adult-equivalent per capita expenditure for further analysis and treated per capita as a reference for comparison.

5.1.3 **Setting Monetary Child Poverty Thresholds**

The following subsections explain how monetary child poverty thresholds were determined from absolute and relative perspectives.

5.1.3.1 Defining an Absolute Monetary Child Poverty Threshold

The thresholds of absolute monetary child poverty can be determined in various ways. In Indonesia, despite the existence of monetary poverty thresholds developed by Statistics Indonesia (BPS) and the World Bank[2], the poverty threshold developed by Pradhan et al. (2001) is the most widely used. The main features of these poverty thresholds can be seen in Table 5-2.

Table 5-2. Comparison of Absolute Poverty Monetary Thresholds in Indonesia

	Basic information	Strengths	Weaknesses
Government of Indonesia: Macro ➔ BPS's threshold (Basic needs)	Combines minimum expenditure for food and non-food.	• Supported by SUSENAS data. • Updated annually using the latest data gathered directly by BPS. • Considers the variations among regions (e.g. price differences in urban vs. rural areas and also provinces).	Not internationally comparable.
World Bank: The Dollar Poverty Threshold	Uses PPP as the basis.	• Internationally comparable. • Can be adjusted every year.	• Developed based on references to other countries (15 poorest countries). Potentially too low. Ignores interregional differences within countries (a line for the countries).
Pradhan et al. (2001)	Combines minimum expenditure for food and non-food. Uses iteration methods to select expenditures.	• Resolves the reference group issues present in the methods proposed by Ravallion and Bidani (1994). • Considers the variations among regions (e.g. price differences in urban vs. rural areas and also provinces).	• Not internationally comparable. • Not updated since it was published in 2001, so it needs to be recalculated or inflated for measuring poverty.

Based on the comparison of the poverty thresholds shown Table 5-2, the poverty threshold from the Statistics Indonesia (BPS) was selected for measuring absolute monetary child poverty. The BPS threshold is regularly updated, which means that it fits the periods of data collection of the IFLS 5. In addition, it was

[2] While often referred to as one-dollar-a-day poverty, the threshold itself has evolved from USD 1 to USD 1.25 and finally to USD 1.9/day per person.

developed based on both food and non-food expenditures and considers the variation of price levels among regions (such as among provinces and urban versus rural areas). The World Bank's a dollar a day was not selected because this thesis is not based on a cross-country comparison and because this threshold ignores the country-specific context. A dollar a day is not a country-specific threshold given that the poverty threshold of one dollar per day per person is a simple average of the national poverty thresholds in the world's 15 poorest countries. Pradhan et al. (2001) threshold was not selected because it is outdated. Even after inflation, their poverty threshold from 2001 would not have provided the required precision.

The specific BPS poverty threshold selected was the provincial poverty threshold for urban and rural areas for March 2015 (BPS, 2017b). This poverty threshold was selected because the data used by the government to estimate it were collected in SUSENAS March 2015, a collection period consistent with the end of the data collection periods of the IFLS 5.

5.1.3.2 Defining a Relative Monetary Child Poverty Threshold

The relative poverty thresholds are not only cover the basic needs but also considered the cost of social inclusion (Garroway and de Laiglesia, 2012). It is consistent with the argument of poverty is a relative phenomenon (Townsend, 1979). Basically, the relative poverty threshold represents the minimum amount of financial resources needed to participate in the society.

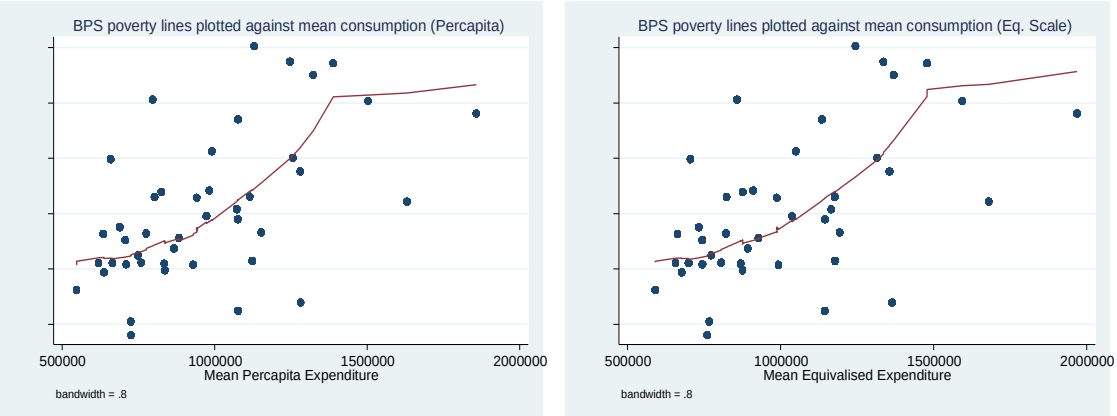
The relative poverty threshold identified was based on the median. Although a relative poverty threshold can be identified based on either the mean or median of expenditure, this thesis used the median because it is less sensitive to extreme values and more widely used. Under this approach, children would be considered as poor when the expenditure of their household below a certain level of median of observed population. Two common median-based thresholds are 50% median (Förster and d'Ercole, 2012; OECD, 2018) and 60% median (de Vos and Zaidi, 1998; European Commission, 2011). In practice, those thresholds often used together (Eurostat, 2018; Garroway and de Laiglesia, 2012). Based on those concepts, children who are poor according to 50% median would be diagnosed as poor according to 60% median. When using 50% median, children whose household expenditure level are between 50% and 60% median of the population

would be considered as non-poor. Considering that both of 50% median and 60% median have been used and supported by their own justification (de Vos and Zaidi, 1998; European Commission, 2011; Förster and d'Ercole, 2012; Garroway and de Laiglesia, 2012; OECD, 2018), selecting one of them should be acceptable. Considering that cost of social inclusion has not been investigated in Indonesia, this thesis used the 60% median of expenditure instead of 50% median for the analysis to reduce the risk of detecting poor as non-poor.

5.1.3.3 Comparison of Absolute and Relative Monetary Child Poverty Thresholds

Of the poverty thresholds discussion above, absolute and relative, to what extent does the poverty threshold reflect the actual expenditures? *Figure 5-3* shows the plotted provincial absolute poverty thresholds based on urban and rural areas (y-axis), against mean per capita expenditure by province and urban and rural (x-axis in left side graph) and mean equivalised household expenditure based on provinces and urban and rural areas (x-axis in right side graph).

Figure 5-3. Scatter plot of absolute poverty threshold versus per capita and equivalised household expenditures.



Note: The absolute poverty threshold refers to the BPS standard

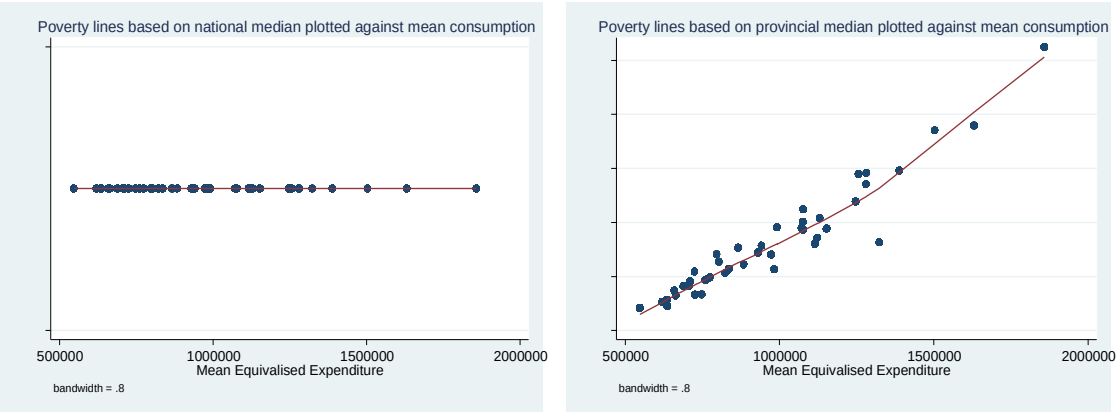
Based on *Figure 5-3*, it can be said that BPS's absolute poverty threshold reflects the mean of expenditure until the critical point, where the threshold becomes nearly constant at the highest level. This situation happens because the government poverty threshold uses spatial price indices to adjust the poverty threshold based on spatial heterogeneity of price. Thus more expensive locations have a higher poverty threshold until the critical point. It can be concluded that

the real value of the absolute poverty rate is constant, with nominal differences generated by the price level shifts due to heterogeneity.

In that case, the relative measures should be more reflective of the spatial heterogeneity of standard of living compared to absolute poverty. The concept of relative poverty assumes that when the expenditure is higher, the poverty threshold is higher (without any maximum level of thresholds). This assumption explains the discrepancies between absolute and relative measures of poverty.

The identification of relative poverty thresholds depends on the identification of population references. Namely, it depends on whether the population reference is at the national level, covering the total sample, or at the provincial level and hence based on a sample per province. Inspired by de Vos and Zaidi (1998), who compare country specific and European-wide relative poverty, this chapter acknowledges the differences between national- and provincial-based thresholds. The plotted mean of the relative poverty threshold (y-axis) against mean equivalised expenditure (x-axis) can be seen in *Figure 5-4*.

Figure 5-4. Scatter plot of Relative Poverty Thresholds (60% Median) versus Equivalised Household Expenditures



Note: Graph to the left uses 60% of national median as threshold. Graph to the right uses 60% of provincial median as threshold.

Figure 5-4 shows that in the context of relative monetary poverty, the national median does not recognise the heterogeneity among provinces. at the poverty thresholds are consistent, or at the same level, across provinces. The measurement of relative poverty using the national median assumes that the poverty line reflects the distribution of wealth in countries regardless of the distribution of wealth in the strata (i.e. across provinces and urban/rural areas).

This pattern is similar to that of absolute poverty with the exception that this poverty threshold will change automatically if there is a change in the level of expenditure of the target population; the absolute poverty threshold, in contrast, will not necessarily follow the change of expenditure.

However, the relative poverty based on the provincial median (urban and rural) is consistent with the heterogeneity among provinces. Thus provinces with a higher mean of expenditures will have a higher poverty threshold. The stratified median places more emphasis on the distribution of household expenditures in the strata (i.e. across provinces and urban/rural areas), though it may not necessarily represent the distribution of expenditures across countries. This indicates that the provincial medians better represent relative poverty in the provinces, but the provincial relative poverty rates are not comparable across Indonesian provinces.

Given these considerations, the absolute poverty threshold as defined by the BPS poverty threshold may provide better estimates in theory, because it not only provides comparable results among provinces but also acknowledges the spatial heterogeneities. The child poverty measurement based on the BPS poverty threshold was estimated using equivalence scales. However, the estimates based on the government's standard poverty threshold, namely the BPS poverty threshold based on per capita, was used as the benchmark.

5.2 Empirical Result of Monetary Poverty among Children in Indonesia

As discussed in previous section, this thesis analysed absolute and relative child poverty using the following poverty thresholds.

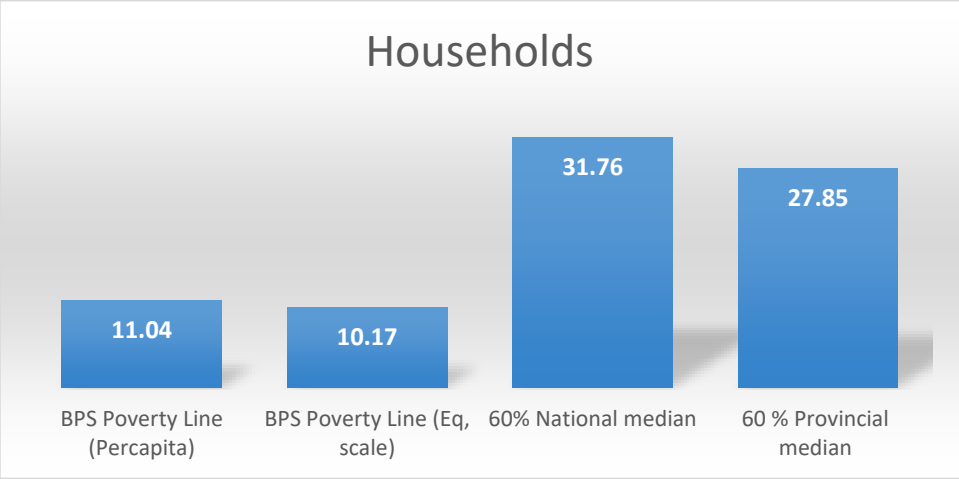
- ***Absolute poverty thresholds***. This thesis used the poverty threshold developed by the government of Indonesia by applying two different approaches. The first was the standard approach applied by the government, namely the per capita approach for identifying individual expenditures. The second was the alternative approach of using equivalence scales as the basis for computing the expenditure of individual household members and thereby measuring poverty based on the government's poverty thresholds.
- **Relative poverty thresholds.** This thesis applied the 60% of median as a threshold to distinguish poor and non-poor in two different ways. The first was by using the national median, wherein poverty thresholds are computed by the median of per capita expenditure from the whole sample. The second was by using a stratified median, wherein poverty thresholds are computed from the median in each urban and rural area for every province.

When comparing the monetary measures, it should be noted that the monetary poverty is measured at the household level. Thus, when a household is poor, every child in the household is poor, and when a household is not poor, every child in the household is non-poor.

5.2.1 Monetary Child Poverty Rates

The main strategy to measure monetary poverty is identification of a poverty headcount that shows the proportion of the poor in any specific group of the population. A poverty headcount is commonly referred to as the poverty prevalence or poverty rate (Ziliak, 2006). The comparison of the poverty prevalence among absolute and relative methods can be observed in *Figure 5-5* and *Figure 5-6*. *Figure 5-5* compares the poverty prevalence among households with children while *Figure 5-6* compares the poverty prevalence among children.

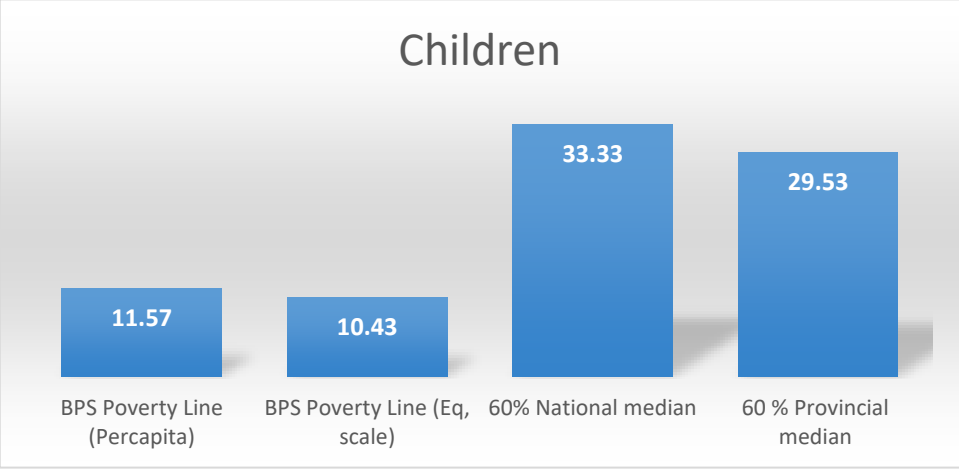
Figure 5-5. Proportion of Poor Households based on Absolute and Relative Monetary Poverty Measures.



Note: The estimation includes only households that have children.

Figure 5-5 and *Figure 5-6* show differences in the poverty rates among households and children. It is clear from those figures that in general, relative poverty rates are higher than absolute poverty rates. There are more poor children and poor households in terms of relative poverty than in terms of absolute poverty. These findings make sense because, as discussed in the previous chapters, the basis of absolute poverty is basic needs, while the basis of relative poverty is relative needs and distribution of expenditures in the society. The poverty thresholds based on absolute poverty are thus often too low, while the relative poverty thresholds tend to be more in line with the expenditure of all households in the observed data.

Figure 5-6. Proportion of Poor Children based on Absolute and Relative Monetary Poverty Measures



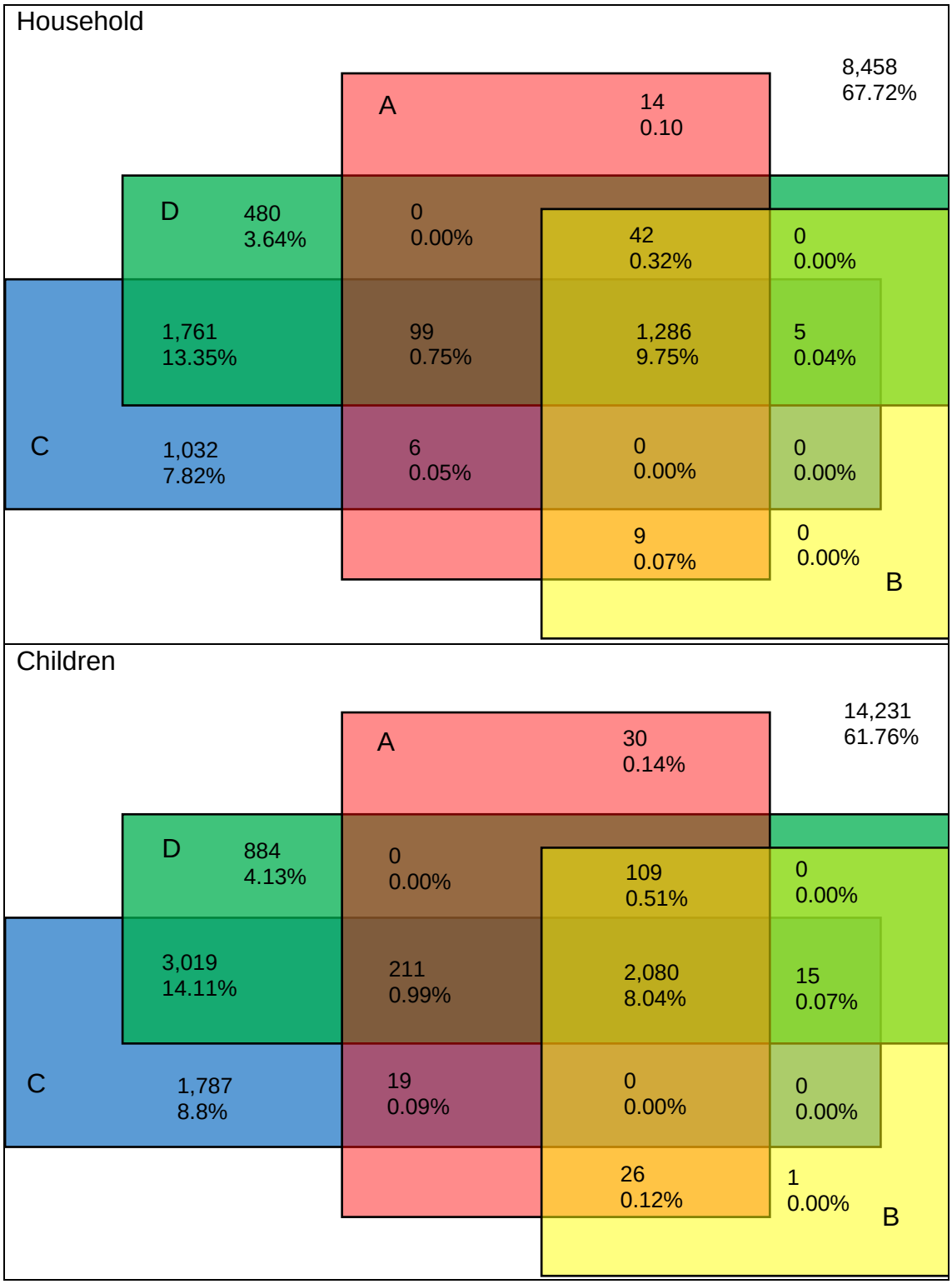
The strategy of dealing with household compositions leads to different figures of the prevalence of poverty. According to *Figure 5-5* and *Figure 5-6*, in terms of absolute poverty, the poverty rates of children and their households estimated using per capita expenditure are higher (11.57% & 11.04% respectively) than the poverty rates estimated using equivalence scales (10.43% and 10.17% respectively). However, since all of the measures started with the same concept of monetary poverty, the measures should overlap. The overlaps and discrepancies among the measures can be observed in section 5.2.2.

Additionally, there are some other findings that should be highlighted. In all measures, child poverty is higher than household poverty, which is consistent with previous studies (BAPPENAS and UNICEF, 2017; Bima and Marlina, 2017; SMERU, 2011; Strauss et al., 2004). This result occurs because on average, poor households have more children. A more detailed comparison of poverty between households and children can be seen in sections 5.2.3 and 5.2.4

5.2.2 Overlaps and Discrepancies between Absolute and Relative Child Poverty

This section discusses the agreement among monetary child poverty measures. The Venn diagrams are shown in *Figure 5-7* which provides a way to visualise the consistency among child poverty measures. The Venn diagrams illustrated the overlap and discrepancies of between absolute and relative monetary poverty measures of households and children. To provide additional evidence of the agreement among the monetary measures, tetrachoric correlations (Table 5-3) inform the relationship between absolute and relative child poverty measures

Figure 5-7. Overlap and Discrepancies between Absolute and Relative Monetary Poverty among Households and Children (Weighted)



Note: The estimation at household level included only households that have children
A: Poor based on BPS poverty threshold (per capita)
B: Poor based on BPS poverty threshold (equivalence scale)
C: Poor based on 60% national median
D: Poor based on 60% provincial median of urban and rural areas

Figure 5-7 shows 4% of children are poor according to the 60% provincial median for both urban and rural areas, but not poor according to any other observed monetary measures such as the measures based on the BPS poverty threshold or on the national median. Assuming that households or children are poor if they fall into any observed monetary poverty measures, 32% of households and 38% of children are poor. However, if we assume the poor are those who are poor according to all measures, only 10% of households and 8% of children are poor.

Despite the discrepancies among the monetary child poverty measures, the correlations among the monetary measures are very high, indicating that the level of the discrepancies is low. Table 5-3 illustrates the tetrachoric correlations among absolute and relative child poverty measures.

Table 5-3. Correlation among absolute and relative monetary child poverty

	A. Poor based on BPS poverty threshold (per capita)	B. Poor based on BPS poverty threshold (equivalence scale)	C. Poor based on 60% national median	D. Poor based on 60% provincial median of urban and rural
A	1.0000			
B	0.9984	1.0000		
C	0.8009	0.7975	1.0000	
D	0.8888	0.9127	0.8980	1.0000

The correlations among the measures in Table 5-3 are very high. Between absolute poverty measures using per capita and equivalised expenditures, the correlations are almost 1 (0.9984). The lowest correlation is between absolute poverty based on equivalence scale and relative poverty based on the median (Even the lowest correlation of 0.7975 (almost 0.8) is also high).

The plot analysis of provincial poverty thresholds in subsection 5.1.3.3 demonstrates that the relative monetary poverty based on the national median is more consistent across provinces than the absolute poverty (BPS per capita and equivalised expenditure). Interestingly, though, Table 5-3 shows that the correlation between the relative poverty based on the provincial median and the absolute poverty is higher than the correlation between the relative poverty based on the national median and the absolute poverty. The table thus provides

supporting evidence that although the absolute poverty thresholds are designed to provide comparable measures among provinces, these thresholds do acknowledge the variation among provinces.

5.2.3 Comparing Monetary Poverty Experienced by Children and Households

This section presents the results from subgroup comparisons of monetary poverty from absolute and relative perspectives. Table 5-4 and Table 5-5 present the rates for households and children according to a range of individual, household, and geographical characteristics.

Table 5-4. Individual, Household and Geographical Characteristics of households in monetary poverty

		Proportion of households experiencing monetary poverty			
		Absolute poverty (%)		Relative poverty (%)	
		BPS poverty threshold (per capita)	BPS poverty threshold (eq. scale)	60% national median	60% provincial median
Education level of household head	No schooling or primary dropout	28.86***	26.27***	59.49***	48.52***
	Primary school	16.77***	15.71***	43.72***	38.04***
	Junior high school	9.65***	8.41***	32.80***	27.64***
	Senior high schools	4.52***	4.22***	18.84***	18.25***
	University	1.70***	1.34***	7.63***	7.01***
Sex of household head	Male	10.16***	9.33***	30.31***	26.19***
	Female	16.16***	15.11***	40.21***	37.51***
Religious affiliation of household head	Other religions	17.16***	16.10***	34.25	29.82**
	Islam	10.22***	9.38***	31.42	27.58**
Occupation of household head	Not working or doing unpaid work	15.98***	15.15***	40.21***	37.58***
	Doing paid work	9.83***	8.95***	29.68***	25.46***
Value of household assets (quintile range in Indonesian million Rp.)	Lowest (0–12.8M)	18.20***	16.36***	45.38***	41.22***
	Lower (12.8–40.8M)	14.45***	13.52***	38.10***	31.43***
	Medium (40.8–96.5M)	10.97***	10.26***	35.30***	30.96***
	Higher (96.5–222M)	8.60***	7.83***	26.48***	23.13***
	Highest (>222M)	2.99***	2.89***	13.27***	12.26***
Areas	Urban	8.26***	7.68***	25.11***	30.97***
	Rural	13.93***	12.77***	39.19***	24.60***
Islands	Java	10.41***	9.67***	31.84	28.33
	Outside of Java	12.05***	10.98***	31.62	27.08

Note: The differences within subgroups were tested using ANOVA. *** is significant at 0.01, ** is significant at 0.05. The estimation included only households that have children.

Table 5-5. Individual, household, and geographic characteristics of children in monetary poverty

		Proportion of children experiencing monetary poverty			
		Absolute poverty (%)		Relative poverty (%)	
		BPS poverty threshold (per capita)	BPS poverty threshold (eq. scale)	60% national median	60 % provincial median
Sex of children	Male	11.41	10.65	33.79	29.44
	Female	11.73	10.20	32.83	29.63
Age group of children	0-4	11.74	10.47	33.54	29.81
	5-6	11.75	10.70	32.14	28.35
	7-12	11.95	10.78	33.92	29.88
	13-15	11.39	10.50	33.00	28.87
	16-17	9.19	8.13	32.33	30.05
Education level of household head	No schooling or primary dropout	31.27***	28.17***	61.26***	47.99***
	Primary school	16.89***	15.54***	45.08***	39.77***
	Junior high school	11.15***	9.44***	35.27***	29.91***
	Senior high schools	4.77***	4.30***	20.93***	20.14***
	University	2.03***	1.34***	7.50***	8.15***
Sex of household head	Male	11.24***	10.14***	32.30***	28.40***
	Female	13.79***	12.37***	40.31***	37.19***
Religious affiliation of household head	Other religions	21.63***	20.39***	39.01***	33.81***
	Islam	9.72***	8.60***	32.28***	28.75***
Occupations of household head	Not working or doing unpaid work	14.51***	13.26***	41.46***	37.73***
	Doing paid work	10.97***	9.85***	31.67***	27.86***
Value of the household assets (quintile range in Indonesian million Rp.)	Lowest (0–12.8M)	19.68***	17.14***	50.67***	45.93***
	Lower (12.8–40.8M)	17.16***	15.90***	42.19***	35.23***
	Medium (40.8–96.5M)	10.60***	9.81***	35.02***	31.26***
	Higher (96.5–222M)	7.61***	6.60***	25.04***	22.97***
	Highest (> 222M)	2.56***	2.44***	13.05***	11.79***
Areas	Urban	7.54***	6.87***	25.56***	32.55***
	Rural	15.58***	13.97***	41.06***	26.53***
Islands	Java	9.53***	8.61***	32.37***	29.34
	Outside of Java	14.07***	12.67***	34.50***	29.77

Note: The differences within each subgroup were tested using ANOVA. *** is significant at 0.01, ** is significant at 0.05.

Disparities arose when the proportion of children who were poor in a subgroup was higher than the proportion in other subgroups. Despite the differences among

measures, Table 5-4 and Table 5-5 present some consistencies in the patterns of disparities illustrated by subgroup comparisons of the poverty rates, especially between absolute poverty and relative poverty based on the national median.

Table 5-4 and Table 5-5 show that household characteristics contributed to the differences in the poverty rates. Child poverty rates are low among children with high education attainment of the head of the household and vice versa. Child poverty rates would be higher for children of female heads of households. Children whose heads of household were Islam had lower poverty rates. Children whose heads of households were unemployed had higher poverty rates compared to children whose heads of households were doing paid work.

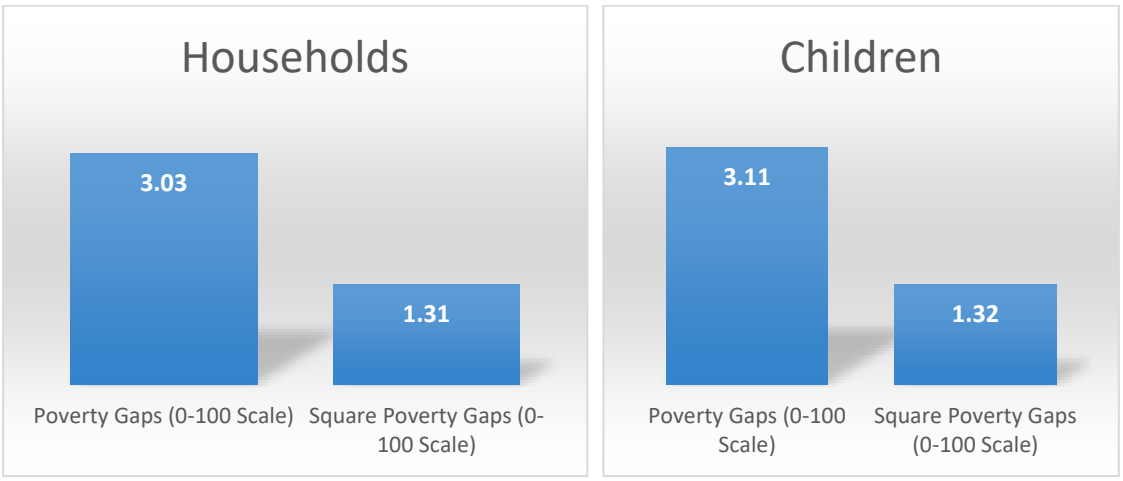
Spatial disparities were also present. Spatial disparities indicate whether children in specific types of geographical areas were in better or worse situations compared to children in other types of areas. Table 5-4 and Table 5-5 show that based on absolute poverty and also on relative poverty based on the national median that child poverty in Java, the densest and most developed region in Indonesia, is lower than outside Java. According to Table 5-4 and Table 5-5 all measures except the provincial median consistently show that poverty in rural areas is higher than in urban areas.

Two main conclusions can be drawn from comparing the poverty rates based on different monetary measures at the subgroup level. ***First***, the differences between Table 5-4 and Table 5-5 confirm that in all subgroups, household poverty does not necessarily capture the whole picture of child poverty. The subgroup comparisons reveal that while in general absolute child poverty rates are higher than household poverty rates, absolute child poverty rates are lower than household poverty rates in some subgroups, for example, in urban areas and in Java. This difference in rates may exist because non-poor households in urban areas and Java tend to have fewer children. ***Second***, Table 5-4 and Table 5-5 confirm that the utilisation of equivalence scales provides different poverty rates for the same poverty thresholds. The absolute child poverty rates based on equivalised expenditure are lower compared to the per capita expenditure in all subgroups.

5.2.4 Depth and Severity of Monetary Poverty among Children and Their Families

This section explores the depth and severity of child poverty. Analysis of the depth and severity of child poverty is an important supplement because poverty headcount, which was used in the previous sections, does not indicate how poor the poor are. This analysis of the depth and severity of child poverty focuses on the poverty measure using the BPS poverty threshold with equivalence expenditure since it is the most robust measure. The depth of poverty was investigated using the poverty gaps ratio, which measures the distance of the poor from the poverty threshold and assigns non-poor a distance of zero. The poverty gaps represent the poverty deficit (Haughton and Khandker, 2009; Ziliak, 2006). The severity of poverty was investigated using square poverty gaps, which measure the square distance of the poor from the poverty threshold and assign the non-poor a distance of zero. Square poverty gaps consider not only the distance from the poverty threshold but also the inequality of the poor (Coudouel et al., 2002; Foster et al., 1984; Foster et al., 2010; Haughton and Khandker, 2009). The estimates of poverty gaps and square poverty gaps can be seen in *Figure 5-8* and Table 5-6.

Figure 5-8. Poverty Gaps and Square Poverty Gaps of Households and Children



Note: The estimation at the household level included only households that have children. The poverty threshold is the BPS poverty threshold based on equivalence scales.

Figure 5-8 shows that poverty gaps and square poverty gaps of households are lower compared to those of children. This situation indicates that poor children are poorer than poor households because on average, poor children are further from the poverty threshold.

Consistent with the comparison of the monetary child poverty rates (or poverty headcount ratios) based on subgroups in section 5.2.3, disparities also exist in the observed poverty gaps and spatial poverty gaps. Table 5-6 shows that poverty gaps and square poverty gaps in urban areas are lower than in rural areas and that poverty gaps and square poverty gaps in Java are lower than outside of Java.

Table 5-6. Poverty Gaps and Square Poverty Gaps according to Individual, Household and Geographical Characteristics of Children

		Poverty gaps (0-100 Scale)	Square poverty gaps (0-100 Scale)
Sex of children	Male	3.13	1.32
	Female	3.08	1.32
Age group of children	0-4	3.19	1.36
	5-6	3.08	1.31
	7-12	3.19	1.35
	13-15	3.13	1.30
	16-17	2.42	1.06
Education level of household head	No schooling or primary dropout	8.68***	3.95***
	Primary school	4.80***	2.09***
	Junior high school	2.78***	1.11***
	Senior high schools	1.08***	0.39***
	University	0.33***	0.07***
Sex of household head	Male	3.02***	1.30***
	Female	3.70***	1.44***
Religious affiliation of household head	Other religions	6.70***	2.97***
	Islam	2.45***	1.01***
Occupations of household head	Not working or doing unpaid work	3.69***	1.49
	Doing paid work	2.99***	1.28
Value of the household assets (quintile range in Indonesian million Rp.)	Lowest (0–12.8M)	5.93***	2.78***
	Lower (12.8–40.8M)	4.46***	1.79***
	Medium (40.8–96.5M)	2.82***	1.18***
	Higher (96.5–222M)	1.65***	0.60***
	Highest (>222M)	0.64***	0.24***
Areas	Urban	1.74***	0.61***
	Rural	4.47***	2.02***
Islands	Java	2.46***	1.02***
	Outside of Java	3.90***	1.69***

Note: The differences within each subgroup were tested using ANOVA. *** is significant at 0.01, ** is significant at 0.05, * is significant at 0.1. The poverty threshold is the BPS poverty threshold based on equivalence scales.

There are high-level consistencies between the headcount ratios in section 5.2.3 when compared to poverty gaps and square poverty gaps in Table 5-6 (except relative poverty based on the provincial median). In the context of individual characteristics, Table 5-6 shows that there are no differences in the depth and severity of poverty among children of different sexes and age groups. The poverty gaps and square gaps based on characteristics of heads of households were also

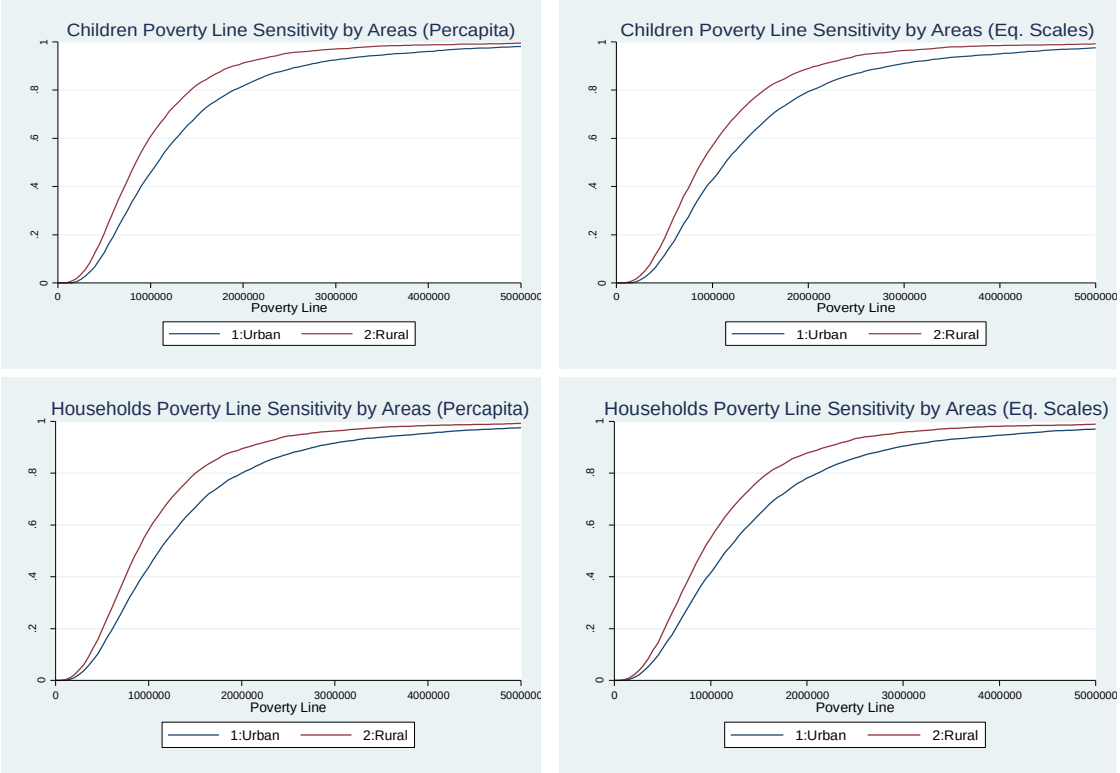
consistent with the headcount ratios. According to Table 5-6, children of educated heads of households have smaller poverty gaps. Children of female heads of households experience more depth and severity of poverty. Children of Muslim heads experience less depth and severity of poverty. Children of working heads also experience lower levels of poverty gaps and square gaps. Children from households with fewer assets experience more depth and severity of poverty.

The consistency among child poverty measures for which subgroups have higher or lower poverty rates or poverty gaps is an indication of robust measures. A measure yielding opposite results compared to other measures is an inconsistency that needs to be explored further. For example, the inconsistency of relative poverty based on the provincial median compared to other measures is an early indication that the relative poverty based on the provincial median is not a robust measure for measuring child poverty. Therefore, further investigation is required to provide a more certain justification for the robustness of each measure.

5.2.5 Checking for Sensitivity and Robustness of Monetary Child Poverty Thresholds

The analysis of robustness in this section focuses on the robustness of poverty threshold. Using the STATA package developed by Araar and Duclos (2013), poverty dominance graphs based on children's data were created to investigate the sensitivity of the poverty thresholds. The sensitivity analysis of the poverty thresholds based on geographic subgroups confirms the robustness of the poverty rates in sections 5.2.3 and 5.2.4. The poverty dominance graphs can be seen in *Figure 5-9* and *Figure 5-10* tests the sensitivity of the poverty thresholds to urban and rural areas. *Figure 5-9* tests the sensitivity of poverty thresholds to the island-based area of Java and outside Java.

Figure 5-9. Sensitivity of poverty thresholds in urban and rural samples



The sensitivity analysis in *Figure 5-9* shows that at various poverty threshold levels, households and children in the rural areas were poorer than those in the urban areas. This finding was consistent with the absolute poverty based on BPS per capita, BPS equivalence scales, and the national median in Table 5-4 and Table 5-5 and with the poverty gaps in Table 5-6. However, it was contradictory to the relative poverty based on the provincial median in Table 5-4 and Table 5-5, which estimated that people in the urban areas were poorer than in the rural areas. This estimation thus confirmed that relative poverty thresholds based on the provincial median are not robust measures to measure child poverty based on urban and rural disaggregation.

Figure 5-10. Sensitivity of poverty thresholds comparing Java vs. islands outside of Java

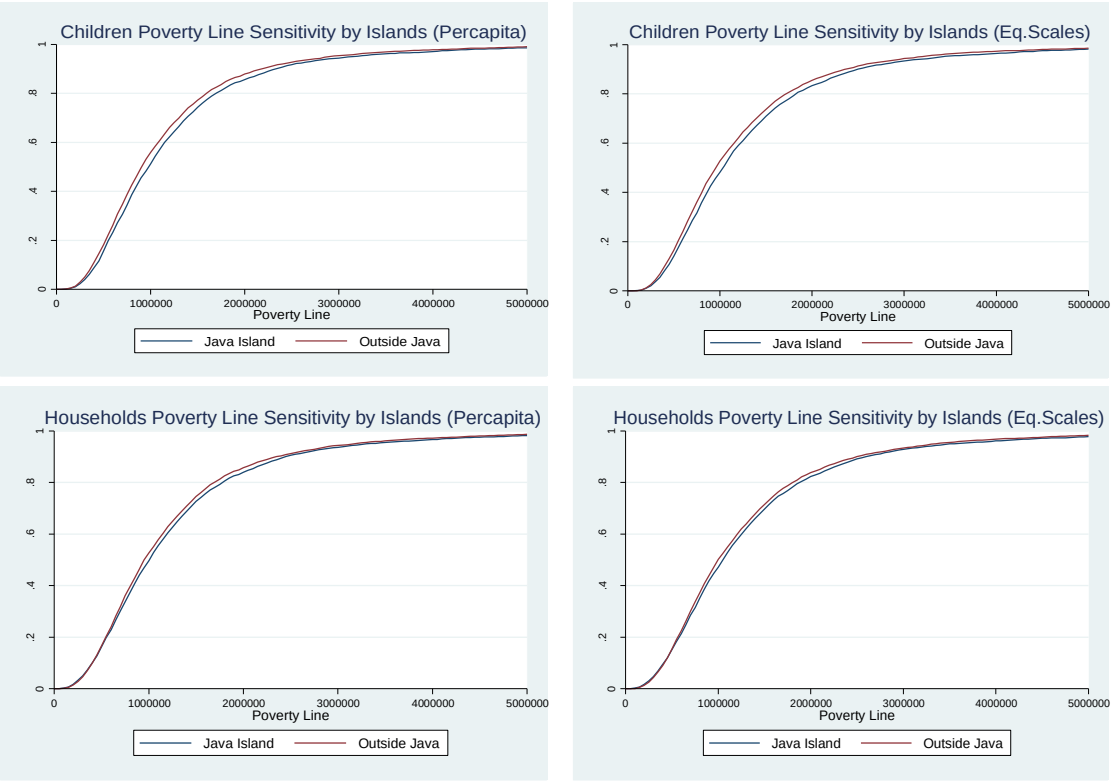


Figure 5-10 shows that at various poverty threshold levels, poverty rates on the island of Java were lower than those outside Java. This estimate confirmed that absolute poverty thresholds, which estimated that children outside Java are poorer than children in Java as shown in Table 5-4 and Table 5-5, are robust measures to provide disaggregated child poverty measures by islands. This estimate also confirms that relative poverty is not a robust enough measure to provide disaggregated poverty rates by island.

Investigating the factors associated with the probability of children being poor also helped to confirm the robustness of the measures in explaining the profiles of poor children and their families. The comparison of the characteristics of the poor children according to the various measures further helped to confirm the estimates of the poverty rates in Table 5-4 and Table 5-5 and also the poverty dominance graphs in *Figure 5-9* and *Figure 5-10*. The odds ratio of the factors associated with child poverty were tested using the logistic regression that can be seen in Table 5-7. Considering that monetary poverty was identified at the household level, the analysis of factor associated with child poverty focused on

household-level indicators. Since sex and age of children are individual-level indicators and differences in poverty rates according to those are not significant in ANOVA, sex and age of children were excluded from logistic regression.

Table 5-7. Factors associated with monetary child poverty measures

	(1) BPS poverty threshold March 2015 (per capita)	(2) BPS poverty threshold March 2015 (equivalence scale)	(3) 60% median of whole dataset	(4) 60% provincial median of urban and rural
Living in urban area	0.812***	0.849**	0.724***	2.491***
	(0.0552)	(0.0604)	(0.0319)	(0.116)
Living in Java	0.935	0.987	1.071	0.901**
	(0.0621)	(0.0684)	(0.0474)	(0.0408)
Highest level of education of head of household (No formal education as reference group)				
Primary school	0.485***	0.513***	0.549***	0.610***
	(0.0524)	(0.0574)	(0.0521)	(0.0600)
Junior high school	0.304***	0.294***	0.382***	0.360***
	(0.0365)	(0.0367)	(0.0385)	(0.0377)
Senior high schools	0.140***	0.145***	0.221***	0.212***
	(0.0178)	(0.0192)	(0.0222)	(0.0221)
University	0.0868***	0.0953***	0.0957***	0.0950***
	(0.0187)	(0.0212)	(0.0133)	(0.0130)
Female head of household	0.931	0.915	1.004	1.055
	(0.0888)	(0.0909)	(0.0687)	(0.0735)
Muslim head of household	0.438***	0.397***	0.818***	0.693***
	(0.0298)	(0.0275)	(0.0467)	(0.0399)
Employed	0.745***	0.736***	0.714***	0.711***
	(0.0627)	(0.0643)	(0.0434)	(0.0428)
Quintile of household assets (lowest asset as reference group)				
Lower	0.892	0.958	0.697***	0.703***
	(0.0713)	(0.0797)	(0.0410)	(0.0431)
Medium	0.473***	0.516***	0.473***	0.541***
	(0.0408)	(0.0463)	(0.0286)	(0.0341)
Higher	0.445***	0.454***	0.362***	0.394***
	(0.0418)	(0.0441)	(0.0231)	(0.0257)
Highest	0.186***	0.206***	0.225***	0.202***
	(0.0264)	(0.0307)	(0.0172)	(0.0155)
Constant	1.834***	1.558***	4.572***	2.453***
	(0.265)	(0.231)	(0.548)	(0.294)
Observations	21,307	21,307	21,307	21,307

Note: *** is significant at 0.01, ** is significant at 0.05, * is significant at 0.1 (Standard Errors of statistics in parentheses).

In general, the findings from the logistic regression are consistent with the poverty threshold sensitivity graphs (*Figure 5-9* and *Figure 5-10*). All of the measures in Table 5-7 show that children who are living in urban areas are less likely to be poor (with more than 0.7 odd ratios) except in terms of relative poverty by the provincial median, which indicates that children in urban areas are more likely to be poor with an odd ratio more than 2. On the other hand, the logistic regression cannot statistically confirm that children living on the island of Java are less likely to be poor. Although children in Java have less chance to be monetary poor compared to children in outside Java, the differences in probability of being monetarily poor in Java and outside Java are small after controlling with other variables.

In looking at the households' characteristics in greater detail, the findings of the logistic regression confirm some findings of the descriptive analysis of the characteristics of poor children in section 5.2.3. Consistent with Table 5-5, all of the measures in Table 5-7 confirm in the same direction that better education of heads of household reduces chances of children being poor. For example, using children of uneducated heads of household as a reference, all measures demonstrate that children whose heads of households are university educated have less than one-tenth the chance of being poor compared to children with uneducated heads of households.

As indicated in Table 5-5, which shows that children with Muslim heads of household tend to have lower poverty rates, Table 5-7 confirms that having Muslim heads of households reduces the chance of children being poor compared to having non-Muslim heads of the households.

Furthermore, all measures in Table 5-7 confirm in the same direction that children from households that have better assets are also less likely to be poor at various levels of magnitude. Children from the households in the lowest quintile of assets are four times as likely to be poor compared to children from households in the highest quintile of assets. Table 5-7 also confirms that child poverty rates were higher in households with unemployed heads.

Some findings of the logistic regression contradict the results obtained from the descriptive analysis in section 5.2.3. Table 5-7 shows the sex of head of

households is not necessarily associated with monetary poverty. Although Table 5-7 also illustrates that children under female heads of households (which is a typical proxy indicator of lone female parents) have higher poverty rates under both absolute poverty lenses, which is consistent with section 5.2.3, the differences are too small to be statistically significant after controlling with other variables.

So which measure is the most robust? The estimates based on different levels of poverty thresholds indicate that the absolute poverty measures seem to be more robust compared to the relative poverty measures. The comparison of the poverty rates based on subgroups (Table 5-4 and Table 5-5), poverty gaps (Table 5-6) with the sensitivity graphs (*Figure 5-9* and *Figure 5-10*), and the logistic regression (Table 5-7) all show that both BPS poverty thresholds, namely the BPS poverty threshold based on per capita expenditure and the one based on equivalised expenditure, appear robust. However, this thesis argued that equivalised expenditure provides better measures compared to per capita because the equivalised expenditure acknowledges the variation of household composition. Thus the measurement using the BPS poverty threshold with equivalence expenditure is the most robust observed measure.

5.3 Conclusion

This chapter investigated the extent and nature of child poverty from monetary poverty lenses and confirmed that absolute and relative poverty measures portray child poverty differently. The proportion of poor children according to relative deprivation was higher than the proportion according to absolute deprivation. The poverty estimates between per capita and equivalised BPS poverty measures were close. However, there were some levels of visible differences among relative deprivation (between the 60% national and 60% provincial median).

When there were discrepancies among the poor and non-poor based on different measures, the overlaps between monetary measures were high. The correlations among the measures were also high, especially among absolute poverty measures.

In the context of methodology, the chapter noticed that setting the poverty threshold is a critical task for a monetary measure. Since the majority of the Indonesian population is within the lower and middle levels of expenditure, the poverty threshold is very sensitive. Even a slight change in the poverty threshold will significantly influence who is identified as poor and non-poor, especially in the lower expenditure population.

The observations of the measures also indicated that household-level analysis and individual-level analysis produce different figures of child poverty. It means household poverty is not necessarily a reflection of child poverty. This finding confirms the importance of individual-level analysis for child poverty measures.

The subgroup disparities were evident almost in all measures, which is consistent with the result of the logistic regression. However, the disparities visible in the provincial-based poverty threshold (60% provincial median) were not always consistent with the other measures, which is an indication of a robustness issue.

Based on the robustness check, the absolute poverty measures (i.e. the BPS poverty thresholds) were better than the relative poverty measures. Absolute poverty thresholds (per capita and equivalised BPS poverty thresholds) provided comparable results across provinces while at the same time acknowledging the heterogeneity across the region. A robustness test also confirmed this finding. Of the two absolute poverty thresholds, the equivalised BPS poverty threshold is conceptually better because the use of equivalised scales acknowledges economic scale and household composition. Therefore, it was selected as the representative of the monetary measures for the remaining chapters of this thesis.

CHAPTER 6. MULTIDIMENSIONAL CHILD POVERTY: ABSOLUTE DEPRIVATION

Chapter Summary

This chapter reports the estimated multidimensional child poverty in Indonesia from absolute deprivation perspectives that take individual, household, and geographical characteristics into consideration.

- This chapter reports the methods (section 6.1) and estimate the absolute deprivation among children in Indonesia (section 6.2).
- Absolute deprivation was measured based on seven domains of child rights covered by the Bristol Method: shelter, sanitation, water, education deprivation, information, food and health.
- Items contained in the index were tested for reliability, validity and additivity.
    - The reliability test found that the measure has low internal consistency because of low inter-items correlation.
    - All of the items were valid.
    - Most of the items were additive.
- As in earlier studies performed in similar country contexts, the absolute child poverty threshold was set at two or more deprivations.
    - 47.61% children were poor according to a one-deprivation threshold.
    - 17.30% children were poor according to a two-deprivation threshold.
- Sub-group analyses revealed the following:
    - Children who were living in rural areas and outside Java were more deprived than those living in urban areas and on the island of Java.
    - Children from households with lower values of assets were more deprived than those from households richer in assets.
    - Children with less educated household heads were more deprived than children with more educated heads.
    - There was no significant difference between male and female child poverty estimates.

6.1 Strategy for Measuring Absolute Deprivation

Based on the research objectives, the measurement and analysis strategy of this chapter took the following steps:

The first step was the selection of indicators. The Bristol Method was applied as the basis to identify the indicators for the analysis. The Bristol Method is one of the existing human rights approaches that are widely used for measuring severe or absolute deprivation among children in many developing countries, including Indonesia.

To develop a good measure, the measurement indicators (or items) should be valid and reliable. Many studies (Fahmy et al., 2007; Gordon and Nandy, 2012; Guio et al., 2012; 2016; Qi and Wu, 2014) have used reliability and validity tests to confirm the selection of indicators. Theoretically, only the indicators that pass these tests should be used for empirical analysis.

However, the strategy did not use the results of reliability, validity, and additivity tests as the basis to select indicators. Instead, the estimates of reliability, validity, and additivity supported the evaluation of the appropriateness of the Bristol Method for the Indonesian context. Since the focus of this chapter is on evaluating the existing measure of absolute deprivation, not to develop a new set of indicators, items that failed on reliability, validity, and additivity tests were not excluded. They were retained and included in the empirical analysis.

The second step was the combination of the indicators to generate composite indices. The main approach for aggregating the indicators was a counting approach (1 count for each deprivation experienced). The index total reflects the extent of deprivation faced by individual children (Alkire and Foster, 2011a; Gordon et al., 2012; Gordon and Nandy, 2012; Gordon et al., 2003; Minujin and Delamonica, 2012).

The third step was selection of the thresholds to distinguish children who were experiencing absolute deprivation. The selection of the thresholds was decided based on an analysis of variance (ANOVA) and a logistic regression.

The fourth step was empirical analysis. Headcount ratios were computed based on the number of deprived children divided by the number of total children to identity the proportion of poor children. There were two different approaches to

identifying the deprived children. The first approach identified the children deprived in each individual domain. The second approach identified the children deprived of composite indices based on the selected thresholds. For the overviews of the extent of child poverty, the headcount ratio from the individual domains and composite indices were described. Then more detailed analysis of the nature of child poverty was carried on through analysis of disparities based on disaggregating the headcount ratio based on individual, household, and geographic characteristics. The differences between disaggregated groups were explored using analysis of variance (ANOVA).

The disparities could be seen not only from the proportions of the poor children, but also from the lenses of the level and intensity of deprivation. Therefore, referring to Alkire and Roche (2012), De Neubourg and colleagues (De Neubourg et al., 2014; De Neubourg et al., 2012a; b), and Foster et al. (1984), the level of deprivation was expressed by the average number of deprivations among the deprived children, while the intensity of deprivation was expressed by the average number of deprivations divided by the total number of deprivation items. The higher the score, the greater the intensity of the deprivation (Alkire and Foster, 2011a; Alkire and Roche, 2012). The adjusted headcount ratio (Alkire and Foster, 2011a; Alkire and Roche, 2012) was also presented to inform the adjusted estimates of the original headcount ratio based on the intensity of deprivation.

6.1.1 **Selecting Absolute Deprivation Indicators**

The selection of absolute deprivation indicators used the human rights-based approach. As discussed previously, previous studies on human rights-based approach have used Multiple Overlapping Deprivation Analysis (MODA) and the Bristol Method. In general, MODA and the Bristol Method share many similarities; this overlap makes sense since both methods were developed based the UN Convention on the Rights of the Child (UNCRC) (De Neubourg et al., 2014; De Neubourg et al., 2012a; b; Gordon et al., 2003; Pemberton et al., 2012; Pemberton et al., 2007). MODA is a step-by-step guideline to measure deprivation among children based on human rights approach (De Neubourg et al., 2014; De Neubourg et al., 2012a; b). Since it is developed based on the local situation, MODA can be considered as the adaptation of Townsend's approach of relative deprivation (Chzhen et al., 2017). However, rather than using socially

perceived necessities to define indicators, MODA uses child rights as the basis (Chzhen et al., 2017). In comparison, the Bristol Method has a set of standard indicators. The set of indicators and the thresholds were designed to investigate absolute poverty from a deprivation lens. Cross-country analyses (Advis and Rico, 2012; Gordon et al., 2003; Nandy, 2012) and some within-country analyses (Gordon et al., 2012; Landiyanto, 2013; Minujin and Delamonica, 2012) have been carried out mainly using the Bristol Method's original indicators. Therefore, the set of indicators in the Bristol Method has certain standards that allow the method to be considered as one of the existing methods of absolute deprivation.

Therefore, this analysis focused on the indicators in the original list of indicators in the Bristol Method (Gordon et al., 2003; Pemberton et al., 2012; Pemberton et al., 2007). The Bristol Method follows the work of Gordon et al. (2003), which considers that children are different to adults and have special needs for protection, survival, and development. This work has been expanded upon in many studies of absolute deprivation (De Neubourg et al., 2014; De Neubourg et al., 2012a; b; Delamonica et al., 2006; Gordon et al., 2003; Pemberton et al., 2012). The Bristol Method is a robust approach because it not only internalises the basic needs of children but also successfully aligns child poverty measurement with child rights (Alkire and Roche, 2012; Gordon and Nandy, 2012). Because it uses multiple indicators and can be operationalised using the existing data such as cluster surveys (MICS) and the demographic and health survey (DHS), the Bristol Method is very suitable for monitoring the fulfilment of child rights and can be replicated in many countries (Advis and Rico, 2012; Alkire and Roche, 2012; Bima et al., 2017; Gordon et al., 2012; Landiyanto, 2013; Minujin and Delamonica, 2012; Nandy, 2012; SMERU, 2011).

However, the Bristol Method focuses on material deprivation, neglecting the social and psychological aspects of deprivation. This focus may be due to the lack of available data; indeed, lacking data is a typical constraint of child poverty studies in developing countries (Jones and Sumner, 2011). Fortunately, it did not become an issue since, as explained in CHAPTER 2, this thesis is not focused on the analysis of social exclusion and psychological well-being.

Theoretically, the Bristol Method is a normative approach based on a combination of human rights and basic needs. According to Pemberton et al. (2012), the

Bristol methods is the translation of the key child rights defined in the UNCRC to measure deprivation. However, while one of the key principles of child rights is indivisibility (UNICEF, 2009b), not all of the human rights in the UNCRC are covered by the Bristol Method. Instead, the Bristol Method incorporates only the human rights that are considered as basic needs for children's survival and development. Therefore, it can be said that the Bristol Method tries to combine the human rights and basic needs approaches. The Bristol Method comprises seven domains of deprivation including shelter deprivation, deprivation of sanitation facilities, water deprivation, education deprivation, information deprivation, food deprivation and health deprivation.

The Bristol Method translates each domain into indicators by applying two levels of deprivation severity: less severe deprivation and severe deprivation (Gordon and Nandy, 2012; Gordon et al., 2003). For operationalisation, this thesis selected severe deprivation and translated the domains of the Bristol Method into the sets of indicators presented in Table 6-1. The corresponding data sources for those indicators can be consulted on Appendix F (Table F-1).

Table 6-1. Overview of the absolute deprivation indicators

Domains	Indicators for 'severe deprivation'	Level of the data	Age group
Shelter	Children living in a dwelling with 5 or more people per room (severe overcrowding) OR with no floor material.	Household	0-17 (all children)
Sanitation	Children with no access to a toilet facility of any kind in or near their house.	Household	0-17 (all children)
Drinking water	Children using surface water such as rivers, ponds, streams, and lakes OR children whose nearest drinking water source is at least 200 metres away.	Household	0-17 (all children)
Education	Children of school age who have never been to school and who are not currently attending school.	Individual	7-17
Information	Children with no access to a radio, television, telephone, newspaper, or computer (i.e. no access to any forms of media).	Individual	3-17
Food (nutrition)	Children who are more than three standard deviations below the international reference population for stunting (height for age) or wasting (weight for height) or underweight (weight for age). This is also known as severe anthropometric failure.	Individual	0-4/ under 5 years old
Health	Children who did not receive any immunisations against disease OR who did not receive treatment for a recent illness involving an acute respiratory infection or diarrhoea.	Individual	0-4/ under 5 years old (immunised) 0-15 (treatment)

The indicators in Table 6-1 are slightly different to those in the original list of indicators in the Bristol Method due to the acknowledging of local contexts and policies and the data availability. Examples of differences include the following:

- The original distance measures on access to water sources according to the Bristol Method are 30 minutes or longer to collect water (walking to the water, collecting it, and returning) or 200 metres (Gordon et al., 2003).

Since data on the required time to collect water were not available in the dataset, the 200-metre distance measure was used to determine children who are deprived of water.

- In the context of Information, radio and computer are included in the Bristol Method but excluded in this thesis because the data were not available. Additionally, access to internet was not included as an indicator of information in the Bristol Method but is included here because the internet is an important information source for the current generation of children (UNICEF, 2017b).

Additionally, since this chapter decided to use the original domains of Bristol methods such as shelter, sanitation, water, education deprivation, information, food and health, other potential domains such as child labour were excluded because of beyond of the scope of this chapter. The possibility of using various domains and indicators of deprivation for child poverty measure would be investigated in CHAPTER 7.

Furthermore, there are some differences in the domain-level thresholds between the Bristol Method and other development standards. For example, the following decisions were taken as well.

- One of the standard thresholds of sustainable development goals for sanitation access is access to the improved sanitation facilities (BAPPENAS and UNICEF, 2017; WHO and UNICEF, 2017); however, this chapter follows previous studies (Gordon et al., 2012; Gordon and Nandy, 2012; Gordon et al., 2003; Minujin and Delamonica, 2012; Nandy, 2012; Pemberton et al., 2012) that have used no access to a toilet facility at the house or near the house. This indicator reveals a worse situation than just not having access to improved sanitation.
- While the sustainable development goals (SDGs) use improved water sources as thresholds, which means the deprived are people who are unable to access an improved water source (BAPPENAS and UNICEF, 2017; WHO and UNICEF, 2017), this chapter follows other studies (Gordon et al., 2012; Gordon and Nandy, 2012; Gordon et al., 2003; Minujin and Delamonica, 2012; Nandy, 2012; Pemberton et al., 2012). Namely, the chapter selects the use of surface water as a source of

drinking water as the deprived-of-water threshold. Children in this situation are in a worse situation compared to children accessing unimproved water sources.

6.1.1.1 Reliability Test

Reliability tests were based on the internal consistency and item response theory. The tests which are commonly used for psychological or educational research, have been adjusted for practical reasons to support the selection of deprivation indicators for child poverty measures (Gordon and Nandy, 2012; Guio et al., 2012; 2016; Qi and Wu, 2014).

6.1.1.1.1 Test for Internal Consistency

The internal consistency test was carried out using alpha coefficients and omega coefficients. Since the data are dichotomous, the alpha coefficients were computed using Kuder–Richardson Formula 20 (KR20). The KR20 can be considered as a special format of Cronbach's alpha for binary variables with dichotomous choices (Cortina, 1993; Ritter, 2010; Streiner, 2003). According to Cortina (1993), Cronbach (1951), and Streiner (2003), KR20 can be considered as the average value of any possible half split reliabilities, while Cronbach's alpha is generally the average value of any possible split reliabilities. KR20 makes assumptions similar to those of Cronbach's alpha. Cronbach's alpha will provide a representative estimate if the item variances of the true score are constant, which is unrealistic (Dunn et al., 2014; Watkins, 2017). Additionally, the estimation of the alpha will require high inter-item correlations between true scores (which is a sign of unidimensionality). When those assumptions are violated, the alpha score tends to be underestimated and lower than the true level of internal consistency (Dunn et al., 2014; Peters, 2014; Watkins, 2017). Therefore, omega coefficient has been recommended since it makes fewer and more realistic assumptions compared to alpha coefficient. It can be said that the omega estimates are close to alpha estimates when the assumptions of the Cronbach's alpha are fulfilled (Dunn et al., 2014; Peters, 2014; Watkins, 2017). The internal consistency of domain-level items can be seen in Table 6-2. The table shows the estimated results of the alpha and omega coefficients and also the alpha and omega coefficients when the items were deleted.

Table 6-2. Internal consistencies of the absolute deprivation items.

		Alpha coefficients if deleted					
	All Children	**Age 0-2**	**Age 3-4**	**Age 5-6**	**Age 7-12**	**Age 13-15**	**Age 16-17**
Education	0.372				**0.451**	0.420	0.402
Health	**0.427**	0.346	**0.336**	**0.456**	**0.525**	**0.537**	
Food	**0.384**	**0.366**	**0.335**				
Information	0.306		**0.338**	0.296	0.299	0.369	0.364
Water	0.264	0.262	0.231	0.250	0.340	0.389	0.359
Sanitation	0.290	0.269	0.211	0.264	0.384	0.420	0.375
Shelter	0.295	0.283	0.256	0.281	0.375	0.415	0.363
		Alpha coefficients					
Reliability scores	0.373	0.354	0.327	0.365	0.448	0.474	0.427
		Omega coefficients if deleted					
	All Children	**Age 0-2**	**Age 3-4**	**Age 5-6**	**Age 7-12**	**Age 13-15**	**Age 16-17**
Education	**0.409**				**0.492**	0.461	0.436
Health	**0.431**	0.386	0.357	**0.481**	**0.533**	**0.556**	
Food	**0.438**	**0.418**	**0.382**				
Information	0.328		**0.383**	0.344	0.335	0.394	0.375
Water	0.318	0.316	0.281	0.337	0.390	0.439	0.395
Sanitation	0.339	0.312	0.259	0.329	0.432	0.465	0.434
Shelter	0.326	0.317	0.290	0.337	0.405	0.448	0.381
		Omega coefficients					
Reliability scores	0.406	0.402	0.366	0.420	0.479	0.507	0.456

Note: The alpha and omega scores of items that will improve internal consistency if deleted are highlighted in bold.

Table 6-2 shows that the measure has low internal consistency. The alpha coefficients are very low, none of the items have an alpha coefficient of more than 0.6, and more than half of the items have an alpha coefficient of less than 0.4. The alpha coefficient is thus lower than it is supposed to be. It may happen because the items were heterogeneous since generated from all seven different domains of deprivation. This situation violates the tau-equivalent assumption resulting in an under-estimation of reliability because the alpha would be in the lower bound of the range of estimation (Cronbach, 1951). Compared to the alpha coefficients, the omega coefficients provide better estimates of reliability for the

heterogeneous set of items. However, overall, the resulting omega estimates are also low.

Table 6-3. Correlation among the items

	1	2	3	4	5	6	7
1. Education	1						
2. Health	-0.1875	1					
3. Food	NA	0.3153	1				
4. Water	0.2361	0.0717	0.0735	1			
5. Sanitation	0.1523	0.0649	0.1131	0.4075	1		
6. Information	0.4003	-0.1154	NA	0.4769	0.3987	1	
7. Shelter	0.2582	0.1384	0.0846	0.3870	0.4094	0.4948	1

Note: Deprived of food is measured in different age groups compared to deprived of education (deprived of food is 0-4, deprived of education is 7-17). Also, very few children who are deprived of information are also deprived of food. Therefore, the correlation estimate of information and food deprivation is not applicable (NA).

A better explanation of low internal consistency is low intercorrelation of the items. Table 6-3 shows the estimates of tetrachoric correlation among domain-level items. Tetrachoric correlation is designed for binary items and hence shows higher correlation scores for binary items compared to Pearson correlation. However, although the tetrachoric correlation is fit to measure correlation among binary items, the result shown in Table 6-3 indicates low correlation among deprivation items. The low correlation shows that although those items measure the absolute deprivation, each item has a low association with the others. Therefore, each item indicates absolute deprivation differently from various angles.

6.1.1.1.2 Item Response Test

Item response theory (IRT) is an approach to investigate the latent traits of binary items (Baker, 2001; Hambleton et al., 1991). Latent traits are typically interpreted as hidden personal characteristics. This interpretation of latent traits is common in many kinds of theoretical literature since IRT was originally developed for education testing and psychology (Baker, 2001; Crocker and Algina, 2008; Hambleton and Jones, 1993; Harvey and Hammer, 1999; Kean and Reilly, 2014).

There are some differences between IRT and testing for internal consistency, which was analysed in the previous subsection. While testing for internal consistency mainly focuses on assessing the construct of the test, IRT pays more

attention to examining the items (de Gruijter and Kamp, 2007; Hambleton and Jones, 1993; Kean and Reilly, 2014).

IRT was designed to investigate the latent traits of a set of binary items (Baker, 2001; Hambleton et al., 1991). Therefore, it is suitable to this chapter, as the chapter is using binary items. Children who are deprived of an item score 1, while children who are not deprived score 0. Thus children who experience more deprivation have higher total scores.

An item response test has three parameters: discrimination coefficients (a), difficulty coefficients (b), and pseudo-guessing coefficients (c). The item discrimination indicates the extent to which any certain item has been correctly answered corresponds to the success of the test. In poverty research, item discrimination refers to the extent of deprivation for any given item able to differentiate between low and high level of absolute deprivation. In a general context, item difficulties show the average level of ability when 50% of the test participants have answered the items correctly. In the context of this poverty research, item difficulty scores indicate the average absolute deprivation score when 50% of the children are deprived of an item. Pseudo-guessing indicates the probability of correct answer although the respondents who did not know the answer but tried to answer the questions through guessing (Baker, 2001; Hambleton and Jones, 1993; Harvey and Hammer, 1999; Kean and Reilly, 2014).

Discrimination and difficulties coefficients can be generated in three possible ways: one-parameter, two-parameter, and three-parameter logistic regression (Baker, 2001; Hambleton and Jones, 1993; Harvey and Hammer, 1999; Kean and Reilly, 2014). One-parameter logistic regression (1PL) will show constant discrimination coefficients (a) across items and different difficulty coefficients (b) of each item. Two-parameter logistic regression (2PL) will not only show difficulty coefficients (b), but also discrimination coefficients (a) for each item. Three-parameter logistic regression (3PL) shows discrimination coefficients (a), difficulty coefficients (b), and pseudo-guessing coefficients (c). Thus 3PL provides more information than 2PL. However, according to Chiu and Camili (2013), Han (2012), Maris and Bechger (2009), and von Darvier (2009), 3PL seems to be problematic because while the a, b, and c parameters interact with each other, the a and b parameters may not necessarily reflect discrimination and

difficulties because of the effect of pseudo-guessing. In the context of absolute deprivation, the items represent the actual condition of the children, and it would be assumed that the respondents know the answer or have the information. Additionally, the data from responded who refused to answer were excluded from the analysis. Therefore, the estimation of pseudo guessing is not relevant for this thesis.

For the item response analysis, this chapter applied a two-parameter logistic regression (2PL). The 2PL model observes item discrimination and difficulties. Difficulty shows where items fall on the latent ability scale (Baker, 2001). In the context of poverty, item difficulty represents the severity of deprivation, and henceforth in this thesis, the term *severity* is used instead of *difficulty*. Item severity focuses on the level of latent deprivation in situations where there is a 50% probability of being deprived in a specific domain. A higher severity coefficient means that the probability that children who were deprived in specific domain level items (i.e. in food or health) would be less than the probability that children deprived in other items at the same level of the latent score of absolute deprivation. According to Baker (2001), a severity coefficient more than three can be considered very high. Items with a very high severity coefficient may disadvantage the composite index since the set of items would have a wide range of item severities and be less reliable. Baker (2001) considers discrimination parameters less than 0.34 as very low and discrimination coefficients between 0.35 and 0.64 as low. Following previous studies of deprivation (Guio et al., 2012; 2018; 2017; 2016), this thesis considers items will too mild if they have severity coefficients lower than -3, and too severe if they have severity estimates higher than 3.

On the other hand, the estimates of discrimination coefficients focused on how well the items discriminate against children who experience absolute deprivation. If items discrimination of certain item is high, the probability of deprived of the item would change rapidly when there change of the level of absolute deprivation. If the items discrimination low, the differences in the probability of deprived in certain items will have a small influence on the change of the level of absolute deprivation. In previous studies, items with discrimination coefficients lower than 0.4 considered as low and have been excluded (Guio et al., 2012; 2018; 2017;

2016). The summary of severity and discrimination coefficients based on the 2PL analysis can be seen in Table 6-4.

Table 6-4. Estimates from two-parameter logistic regression model

Item	Two-parameter logistics[1]	
	Severity[2, 3]	Discrimination[2, 4]
Water	**1.2476**	**1.4859**
Information	**1.9613**	**2.1140**
Sanitation	**1.9680**	**1.3474**
Shelter	**2.2229**	**1.6420**
Education	3.5903	**0.8962**
Health	16.1751	0.0890
Food (Nutrition)	55.6099	0.0537

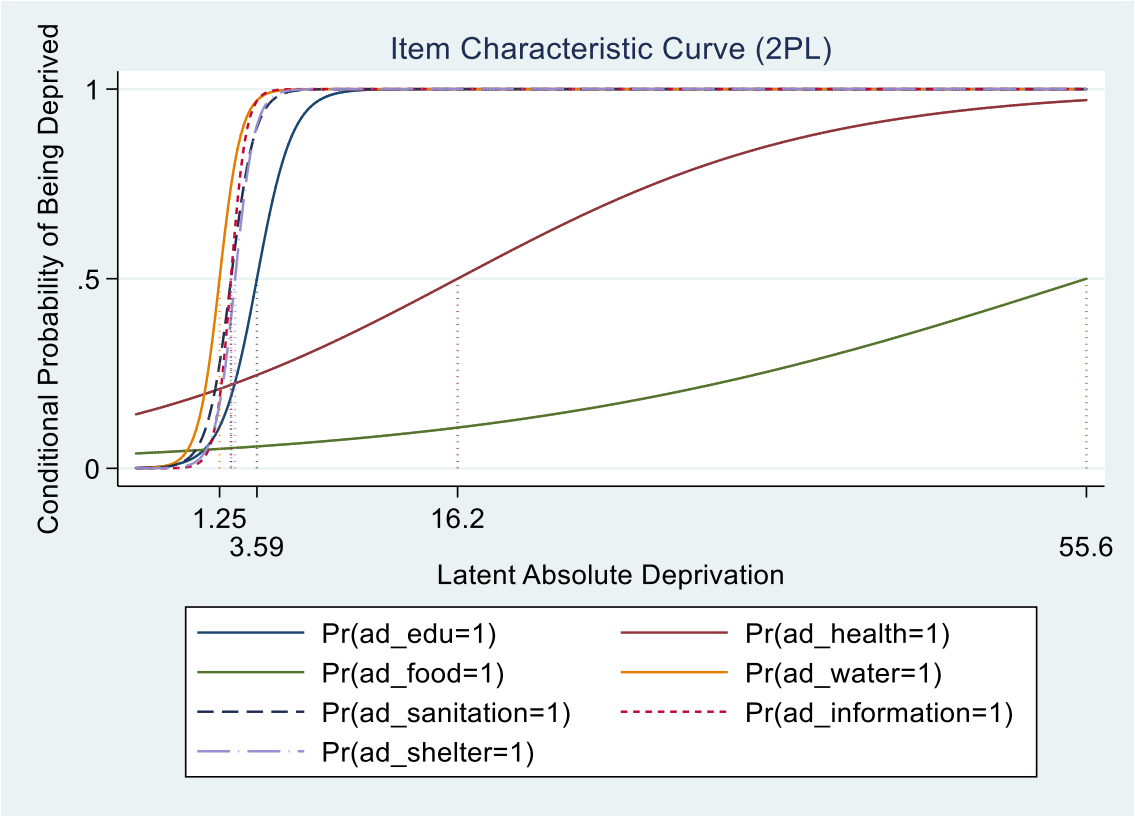
Notes: [1]LR Chi Square is 706.67 with Prob> Chi2 = 0.001.
[2] All intercepts' estimates are significant to 0.001 level.
[3] Items with severity coefficient between -3 and 3 in bold.
[4] Items with discrimination coefficient more than 0.4 are in bold

Table 6-4 shows that food (nutrition) and health have higher estimates of the severity coefficients compared to the other items. The parameters of the severity coefficients of food and health are very high. Therefore, the majority of the children who are deprived of food and health are more likely to be experiencing multiple deprivations in other items.

The high severity coefficients of food and health are consistent with the low discrimination coefficients of those items. Both food and health have discrimination coefficients less than 0.1.

Water has the lowest estimated severity coefficient. Thus, at the same level of the latent score of absolute deprivation, the probability that children are deprived of clean water is higher than the probability of children being deprived of other items. In other words, children who are deprived of water are not necessarily deprived of other items.

Figure 6-1. Item characteristic curve from two parameters logistic regression



Note: The figure was estimated from children age 0-17. ad_edu = deprived of education, ad_health = deprived of health, ad_food = deprived of food, ad_water = deprived of water, ad_sanitation = deprived of sanitation, ad_information = deprived of information, ad_shelter = deprived of shelter

As a complement to Table 6-4, the items' characteristics curve (*Figure 6-1*) shows a visual presentation of the relationships of the probability of being deprived of certain items with the latent variable of absolute deprivation. The ICC items of food and health illustrate different patterns compared to the other items. The differences might exist because those items, especially food, are age specific. However, age specificity is not necessarily causing the anomaly since other age-specific indicators, such as education and information, have a pattern (such as in severity and discrimination) very similar to that of the household-level indicators such as sanitation and shelter.

Despite this severity and discrimination problem, the items of health and food were included in further analysis because the purpose of the item response analysis was to evaluate the existing set of absolute deprivation items. To reiterate, this chapter does not intend to develop a new set of items by which to measure absolute deprivation.

6.1.1.2 Validity Analysis

This thesis referred to previous studies as the basis to identify the validity of the items. The validation strategy was criterion validity, which uses validators to predict the validity of individual criteria (Crocker and Algina, 2008; de Gruijter and Kamp, 2007).

Some studies (Gordon and Nandy, 2012; Guio et al., 2012; 2016; Qi and Wu, 2014) have used income as an external variable to test validity. Based on theory, deprived children should live in households with lower income than non-deprived children. The cited studies have consequently operationalised their validity testing by using regression approaches that employ income as an independent variable to validate deprivation items. Therefore, income was selected as one of the validators for the validity test. Since this thesis uses expenditure instead of income for monetary measures, equivalised expenditure also became a validator for the validity test. Additionally, as a supplement, the test was also conducted using total value assets as a validator considering that assets are widely used for measuring wealth in developing countries (Wai-Poi, 2011). The results of the validity test can be seen in Table 6-5.

Table 6-5. Result of validity test

	Log equivalised expenditure	Log household assets	Log equivalised income
Education	-0.416***	-0.167	-0.184***
Health	-0.085	-0.067	-0.049***
Food	-0.217	-0.148	-0.055***
Information	-0.921***	-0.218***	-0.413***
Water	-0.506***	-0.396***	-0.230***
Sanitation	-0.839***	-0.406***	-0.424***
Shelter	-1.015***	-0.424***	-0.412***

Note: The figure was estimated from children age 0-17.
*** is significant at 0.01, ** is significant at 0.05, * is significant at 0.1.
Deprivation categories in each domain are 1 for deprived and 0 for non-deprived.

Table 6-5 shows that some items are not valid, especially according to equivalised expenditure and assets. It means deprived children are not necessarily living in households with lower expenditure and assets. In greater detail, children who are deprived of health and food are not necessarily from households with lower expenditure. Similarly, children who are deprived of

education, health, and food are not necessarily from households with fewer assets.

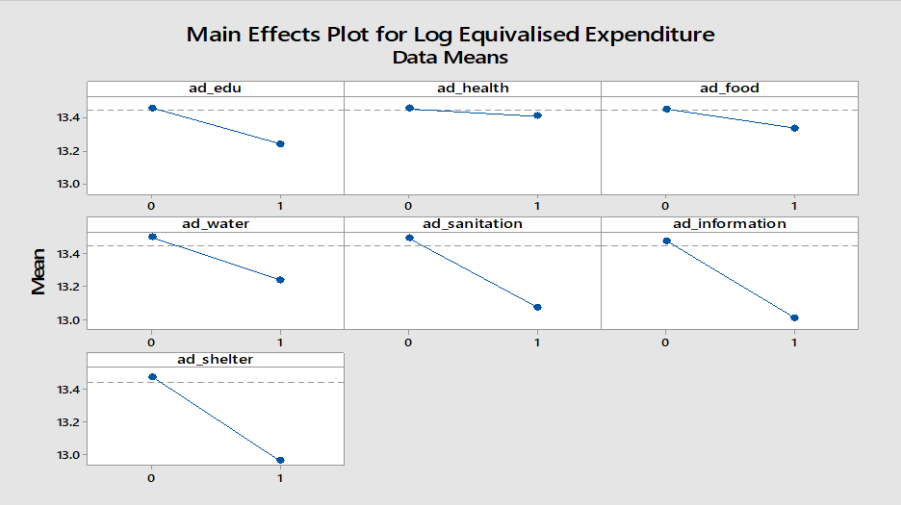
According to studies that have used a validity test on poverty measures (Fahmy et al., 2007; Guio et al., 2012; 2018; 2017; 2016), the items can be considered as valid if they are valid in two validators (out of three validators). According to the criteria above, it could be interpreted that education, information, water, sanitation, and shelter were considered as valid items because these items were valid in two validators or more. Conversely, health and food were not valid because they were only valid according to log equivalised income.

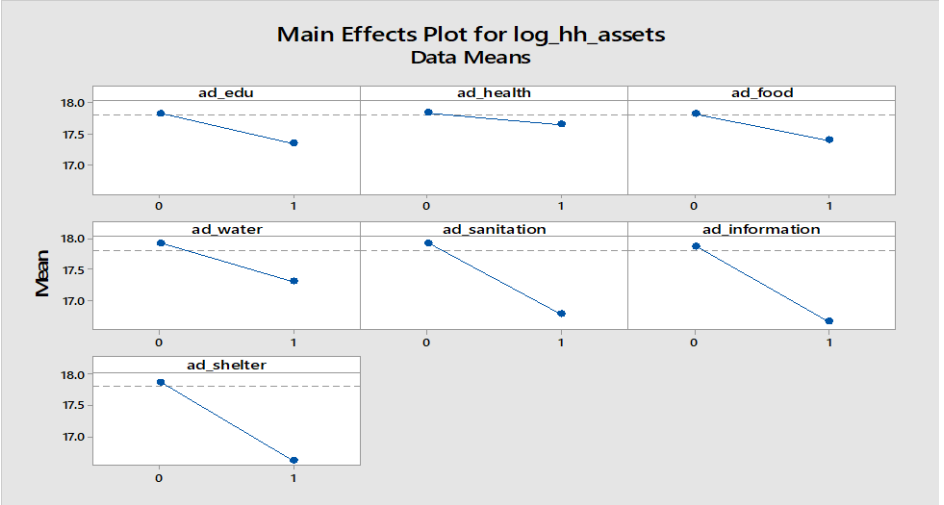
6.1.1.3 Additivity Analysis

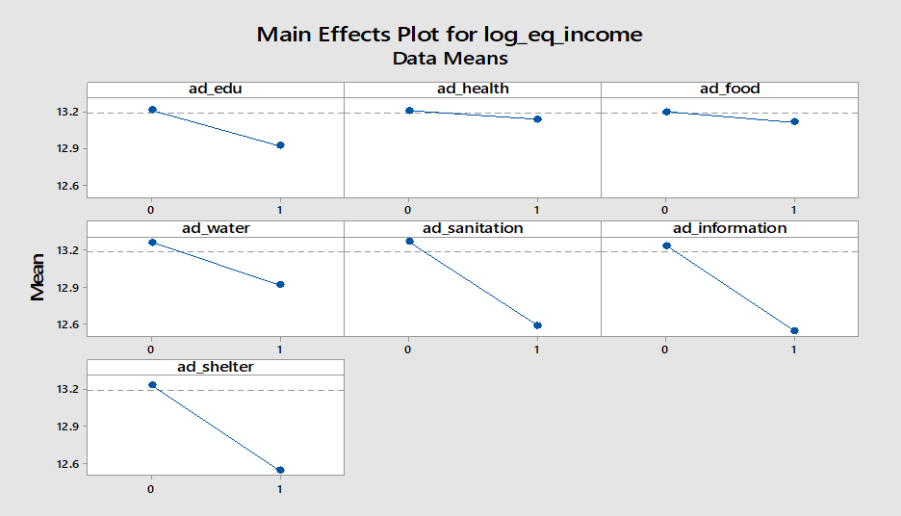
The additivity test aimed to determine whether the children who are deprived in more indicators are experiencing more severe absolute deprivation, i.e. children who are deprived in two indicators are more deprived than children who deprived in one indicator, and children who are deprived in three indicators are more deprived than those deprived in only two indicators, etc. (Gordon and Nandy, 2012).

The strategy for an additivity test is to investigate the main effect and the bivariate interaction effect of the items. The main effect plots of deprivation domain-level items were estimated through comparing the equivalised expenditure, households' assets, and equivalised income of children who are deprived and non-deprived in each domain. The main effect plot can be seen in *Figure 6-2*.

Figure 6-2. Main effect of absolute deprivation indicators on log equivalised expenditures, log household assets, and log equivalised income (age 0-17)





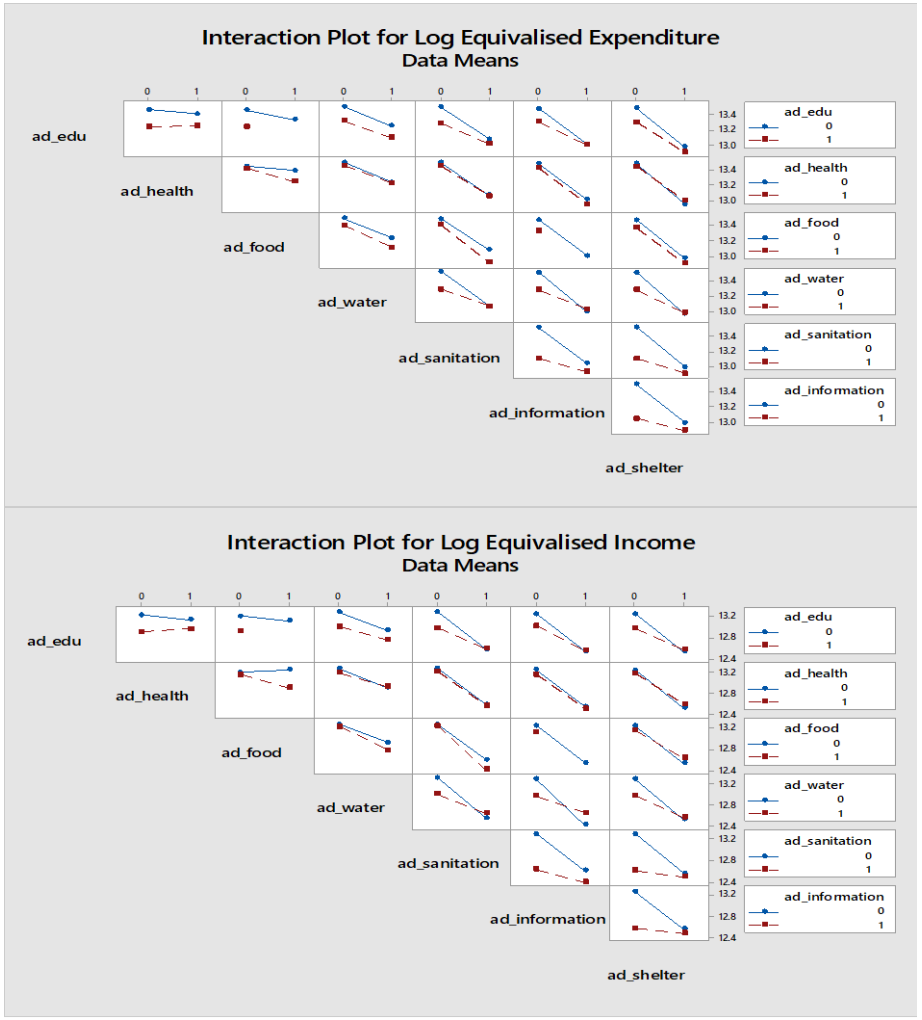


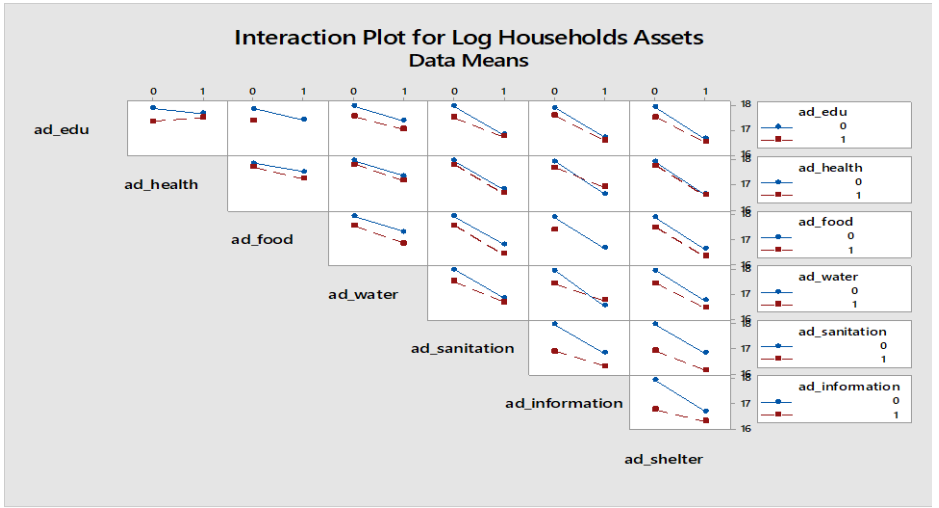
Note:
ad_edu = deprived of education
ad_health = deprived of health
ad_food = deprived of food
ad_water = deprived of water
ad_sanitation = deprived of sanitation
ad_information = deprived of information
ad_shelter = deprived of shelter

Figure 6-2 shows that the households of deprived children have lower equivalised expenditure, households' assets, and equivalised income than the households of non-deprived children. It can be seen that the differences between children who are deprived of health and children who are non-deprived in this domain are small. However, the main effect plot does not reveal whether children who are deprived in two domains also have a lower level of expenditure, assets, and income. Therefore, an analysis of bivariate interaction was carried out to generate more evidence.

Second-order interaction plots, as shown in *Figure 6-3*, were used to investigate the bivariate interaction. Consistent with the main effect plot, the interaction plot uses equivalised expenditure, households' assets, and equivalised income as the criteria. While the main effect plot compared expenditure, assets, and income of children who are deprived and not deprived in the observed indicators, the interaction plot compared the plots of expenditure, assets, and income of two different items' interaction. The main was assumption that children who are deprived in two items should have a lower level of reference standards (expenditure, assets, or income) when compared to children deprived in only one item. If not, it could indicate an issue, especially if it happens in more than half interaction of an item with other items. The issue would be considered as serious if the assumption were violated in more than one reference standard (e.g. an item has issue in both expenditure and assets).

Figure 6-3. Second-order interaction effect of absolute deprivation indicators on log equivalised expenditures, log household assets, and log equivalised income (age 0-17)





Note:
ad_edu = deprived of education
ad_health = deprived of health
ad_food = deprived of food
ad_water = deprived of water
ad_sanitation = deprived of sanitation
ad_information = deprived of information
ad_shelter = deprived of shelter

Deprivation in food is measured in different age groups compared to deprivation in education. Very few children who were deprived of information were also deprived of food. Therefore, the red plots of their interaction show only dots.

Figure 6-3 shows that some combinations of the items seem to have additivity issues. For example, the combination between deprivation of information and deprivation of health appears problematic. Namely, children who are deprived of information have lower assets than children who are deprived of both information and health.

However, a conclusion cannot be drawn solely based on one reference in the interaction plot. The estimates based on expenditure and income show that there is no problem in the interaction between health and information. Therefore, the interaction issue can only be considered as a serious problem for a specific item when it happens in at least two criteria (two reference standards).

Interaction issues may also be present if there is a statistical power problem. In the context of interaction between information and health, further investigation confirms the low statistical power in the interaction because of few interacting cases (mainly caused by few overlaps). A crosstabulation between children deprived of health and children deprived of information shows that only 179 children are deprived of both. The number is small compared to the 1,337 children who are deprived of information and the 4,070 children who are deprived of health. The findings seem to show interaction issue may be present simply because there are so few children who are deprived of both information and health. Therefore, the interaction issue can be considered as problematic if the interaction issues are present when an item has interaction issues with many other items (not issues only with one other item) and without issues of statistical power.

Therefore, it can be concluded that the items are additive. Although there are some issues in the interaction plot, the issues can be considered as minor since most of them are caused by low statistical power. Additionally, the main effect plot supports that the items are additive.

6.1.2 Calculating Absolute Deprivation Index and Setting the Poverty Threshold

The aggregation was conducted at the domain level. This means that the individual items were aggregated for creating domain-level items, and then the domain-level items were combined into a composite index of absolute deprivation indicators. The advantage of domain-level aggregation is that every domain is equally represented without any dominant domain. While it may pose a risk of less variability among children, it was conceptually more acceptable since children were measured by fewer domains rather than by many subdomains. In addition, each domain represents a right of children, so domain-level analysis acknowledges that all these rights are equally important. On the contrary, subdomain-level aggregation would have been sensitive to the number of indicators in each domain, which means that a domain with more indicators would have had more weight. Having different weights in each domain may not necessarily have fit the human rights-based approach. In the human rights-based approach, each right is equally important. Thus domain-level aggregation was more appropriate for the human rights-based approach.

The domains were aggregated using raw sum score. All of the items were combined via summation of the numbers of deprivation experienced by children. Since the domains were equally important, an equal weight of the same level was assigned to each domain.

Since the value of each item is zero and one, the value range of the sum score is between zero and the number of items. The minimum value of the composite index is zero, and that value would indicate that children are not experiencing any deprivation. The maximum value of the composite index is the same as the number of indicators. The sum score represents the absolute deprivation score.

There are three possible methods for defining the identification criteria of poverty thresholds for a counting-based composite index (raw sum score) from a conceptual perspective (Alkire and Foster, 2011a).

- The first is the union method of identification, which was used by Bourguignon and Charavarty (2003). Using this approach, a child is said to be poor if there is at least one indicator in which the child is deprived.

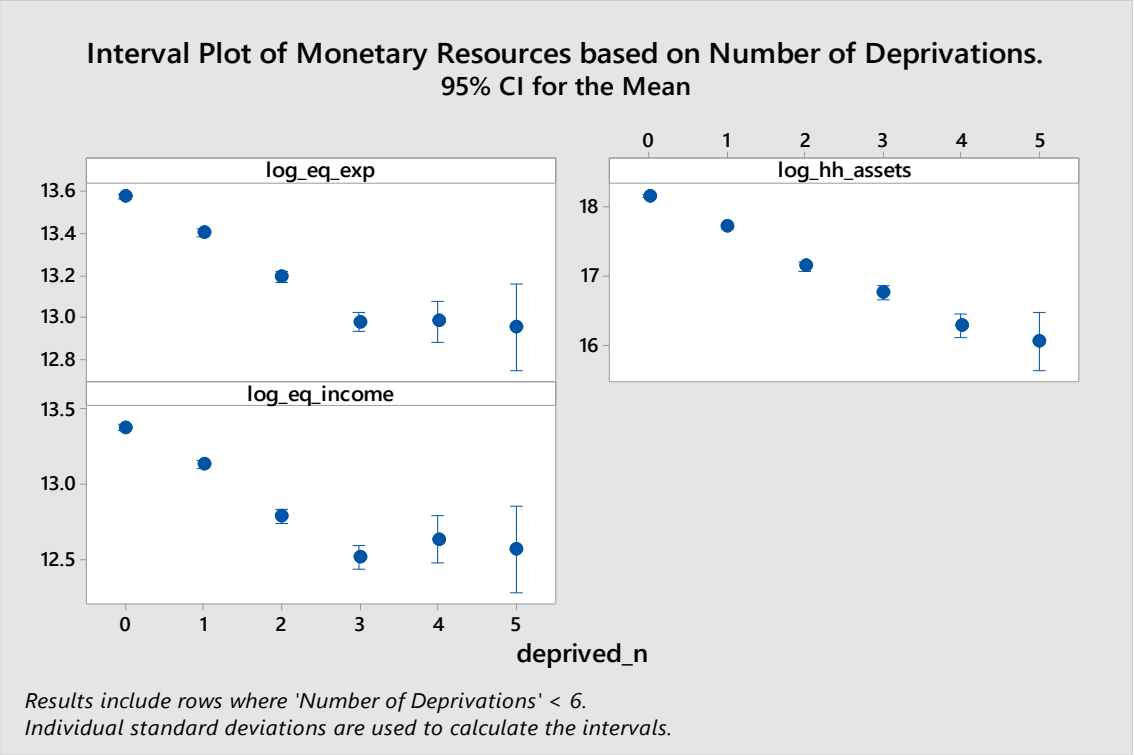
From a human rights lens, the union approach is theoretically sound. From a human rights-based approach, deprivation in one item is an indication of a violation of child rights.

- The intersection approach, which is the second possible identification method, identifies a child as poor only if the child experiences deprivation in all indicators.
- The third type of identification is putting a threshold anywhere between one indicator and all indicators; this approach has been used in many child poverty studies (Alkire and Roche, 2012; Gordon et al., 2012; Gordon and Nandy, 2012; Gordon et al., 2003). This type is more flexible compared to the union or the intersection approach, but setting an appropriate level of thresholds seems to be arbitrary.

Despite its arbitrariness, different levels of thresholds have their own meaning. While deprivation in one of the domains can be considered as severe deprivation since it reflects a violation of child rights (Gordon et al., 2012; Gordon and Nandy, 2012; Gordon et al., 2003), Gordon and Nandy (2012) consider that being deprived in one domain level item does not necessarily reflect multiple disadvantages. Furthermore, they point out that children would be in a situation of absolute poverty upon experiencing multiple disadvantages being deprived in at least two domain level items.

A confidence interval (CI) plot displays the sensitivity of different levels of absolute deprivation thresholds. The sensitivity illustrates the change of the level of deprivation as impact the change of expenditure, income and assets. The level of the log of equivalised expenditure, the log of households' assets, and the log of equivalised income of different levels of the score were compared. Children experiencing more deprivation were supposed to have a lower level of expenditure, assets, and income as an indication of additivity. The level of thresholds with the highest sensitivity was used to identify the appropriate thresholds.

Figure 6-4. Log equivalised expenditures, log household assets, and log equivalised income of each level of absolute deprivation (age 0-17)



Note: log_eq_exp = Log Equivalised Expenditure, log_hh_assets = Log Household Assets, log_eq_income = Log Equivalised Income. The estimates in the plots excluded children who are deprived in 6 indicators or more.

In addition, to inform the sensitivity of the thresholds, a confidence interval (CI) plot was also produced to support the additivity test in the previous section. The CI plots in *Figure 6-4* confirms that the items are additive. *Figure 6-4* shows that that the increasing number of deprivations is in line with the decreases in the mean of equivalence expenditure, household assets, and equivalence income. Thus children experiencing more deprivation have a lower level of expenditure, assets, and income, and vice versa.

Figure 6-4 also shows that the sensitivity is high between deprivation in one indicator and deprivation in two indicators, which suggests that deprivation in two indicators or more is an appropriate threshold.

To confirm the level of appropriate thresholds, a statistical test was used to determine the optimum poverty threshold. Gordon and Nandy (2012) illustrate that the threshold of absolute deprivation could be investigated by using logistic regression and analysis of variance (ANOVA), both of which are applied in this thesis accordingly.

In the logistic regression, the dependent variable was the binary variable that distinguished deprivation at a certain level (i.e. two domains or more) from non-deprivation. The independent variables were a log of equivalised expenditure, the number of adults, and the number of children in the households. The LR chi2 estimates from logistics regressions using various level of deprivation as dependent variable were compared. The model with the highest LR chi2 estimate was selected as the threshold.

In ANOVA, the dependent variables were a log of equivalised expenditure, while independent variables were a binary of different levels or deprivations and also the number of adults in the households and the number of children in the households. The 'F' estimates for the ANOVA models of different levels of deprivation were compared. The threshold was identified from the deprivation level of the model with the highest 'F' estimates. The estimation results can be seen in the following table (Table 6-6).

Table 6-6 Logistic regression and ANOVA to identify the position of threshold of absolute deprivation

	Logistic Regression (LR Chi 2)	ANOVA (F)
Base model*	-	141.45
Deprived in one indicator or more	1452.04	173.24
Deprived in two indicators or more	**1977.24**	**181.16**
Deprived in three indicators or more	1295.39	162.66
Deprived in four indicators or more	431.80	143.86
Deprived in five indicators or more	113.02	138.38

*Model uses only number of adults and number of children as independent variables.

The logistic regression and ANOVA provided consistent indications of the appropriate level of the poverty threshold. The logistic regression and ANOVA showed that deprivation in two indicators or more was the appropriate threshold

since it has the highest level of LR chi2 and ‘F’. The estimated threshold of two indicators or more is consistent with the thresholds applied in another global study of child poverty (Gordon et al., 2003).

Therefore, deprivation in two indicators was used for the empirical analysis, and deprivation of one indicator was used for the comparison. This one deprivation threshold was consistent with the human rights concept, which indicates that a violation in any single domain can be considered as a violation of human rights.

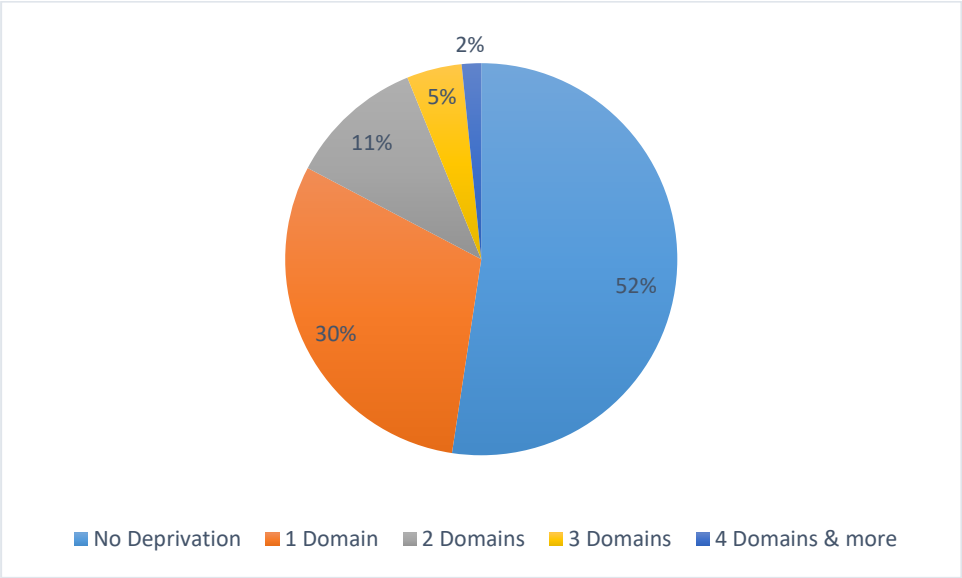
6.2 Absolute Deprivation among Children in Indonesia

This empirical section consists of the following sections. First, it provides a general overview of absolute deprivation (section 6.2.1). The overview briefly covers the deprivation experienced by children and the deprivation in each domain. For deeper analysis, two composite indices were determined by the selection of thresholds: children deprived in one domain level item and children deprived in two domain level items. The disparities based on composite indices are covered in the next subsection (section 6.2.2). Those disparities incorporate geographic, household, and individual disparities based on the raw total score. The disparities based on intensity and level of deprivation are covered in section 6.2.3. Furthermore, this section describes the disparities based on individual deprivation indicators (section 6.2.4). Finally, this section evaluates the sensitivity and robustness (section 6.2.5).

6.2.1 Overview of Absolute Deprivation

The proportion of non-deprived children and the proportion of children experiencing different levels of deprivation can be seen in *Figure 6-5*.

Figure 6-5. Numbers of deprivation experienced by children



Almost half of the children are deprived. *Figure 6-5* shows that most of the children (30% of the total children, or 63% of the children who are deprived) are deprived in one domain. However, some children are experiencing deprivation in more than one domain. The number of children who are deprived in two and three domains is also large (11% and 5% of total children, or 22% and 10% of children who are deprived). Only a small percentage of children are deprived in four domains or more.

An investigation of the domain-level deprivation helped unpack the nature of the deprivation experienced by children. As discussed previously, there are seven domains: shelter, sanitation, water, education, information, food and health. The proportion of deprived children according to each domain based on their referred age can be seen in Table 6-7.

Table 6-7. Proportion of deprived children in each domain of absolute deprivation (%)

	All children		Age specific children	
	Number of observed children	% Deprived children	Number of observed children	% Deprived children
Shelter	21396	7.40	21396	7.40
Water	21396	19.19	21396	19.19
Sanitation	21396	10.97	21396	10.97
Education	21396	5.62	11720	9.86
Health	21396	19.02	19835	20.61
Food	21396	4.48	8346	12.11
Information	21396	6.25	17174	7.68

Healthcare is a major problem. Table 6-7 shows that more than 20% of children less than 15 years old are deprived of health care; They either did not receive any immunisation or did not get any treatment when experiencing major illness. Drinking water is also a major issue in Indonesia. Table 6-7 shows that 19% of children are deprived of water; Accordingly, 19% of children are using surface water as drinking water or live a long distance away from drinking water sources. When the global standard of deprivation in the water sources is used, the figure is even higher, at about 59% of children using unimproved water sources.

Sanitation and shelter also appear to be critical issues. Table 6-7 shows that about 11% of children experience deprivation in sanitation. Thus 10% of children do not have access to toilet facilities, because the domain level threshold of sanitation is no access to sanitation facilities. This number is considerably high, but it seems to be consistent with the high level of deprivation in water.

Compared to other domains, access to adequate shelter is a less severe issue in Indonesia. According to Table 6-7, more than 7% of children are deprived in the shelter domain, meaning that they are living in overcrowded houses or houses with no proper floor materials.

In the context of children as individuals, food deprivation is also a concern. According to Table 6-7, just over 12% of children under 5 years old are malnourished. The level of malnutrition is considered as high because the cut-off standard to estimate wasting, stunting, and underweight is based on three standard deviations (which is more severe compared to the more common

standard of two standard deviations). Education can also be considered as an important issue in Indonesia. Table 6-7 shows that almost 10% of children aged 7–17 years old experience deprivation in education.

Table 6-7 also shows that only 8% of children over 3 years old is deprived in information. These children do not have access to the internet, mobile phones, or television. This figure is considerably low compared to other domains but makes sense because the majority of households have a television, and more than 85% of children have access to television. In addition, Indonesia has experienced rapid mobile phone penetration and internet expansion (Das et al., 2016).

6.2.2 Disparities in the Absolute Deprivation based on Composite Indices

There are many ways to observe the disparities based on the composite indices of absolute deprivation (i.e. children deprived in one item and children deprived in two items). One common approach involves the comparison of proportions of the children who experience absolute deprivation across different subgroups (Gordon et al., 2012; Gordon et al., 2003; Minujin and Delamonica, 2012; Nandy, 2012; Roelen, 2010; Yousefzadeh, 2013; Yousefzadeh et al., 2012). The comparison of subgroup disparities based on the proportion of children deprived in at least one items and at least two items can be seen in Table 6-8.

Table 6-8. Proportion of children deprived in one or two domain-level items by individual, household, and geographic characteristics subgroups

Subgroups		Proportion of children who experience absolute deprivation	
		Deprived in one item (%)	Deprived in two items (%)
Sex of the children	Male	47.71	17.05
	Female	47.50	17.56
Education level of household head	No schooling or primary dropout	69.93***	43.75***
	Primary school	56.95***	23.49***
	Junior high school	49.59***	16.86***
	Senior high schools	36.01***	9.25***
	University	30.14***	5.01***
Sex of household head	Male	47.61	17.42
	Female	47.60	16.45
Religious affiliation of household head	Other religions	68.51***	40.27***
	Islam	43.76***	13.07***
Occupations of household head	Not working or doing unpaid work	46.86	15.99**
	Doing paid work	47.76	17.56**
Value of household assets (quintile range in Indonesian million Rp.)	Lowest (0–12.8 M)	58.97***	28.12***
	Lower (12.8–40.8 M)	56.34***	24.77***
	Medium (40.8–96.5 M)	48.80***	16.64***
	Higher (96.5–222 M)	41.19***	10.30***
	Highest (>222 M)	32.09***	6.32***
Areas	Urban	34.06***	6.64***
	Rural	61.10***	27.92***
Islands	Java	40.96***	10.83***
	Outside of Java	55.80***	25.27***
Total		47.61	17.30

Note: *** is significant at 0.01, ** is significant at 0.05.

Sex of children and sex of heads of households do not seem to contribute to the disparity in absolute deprivation. Table 6-8 shows that there are no statistically significant differences in the proportion of children who experience absolute deprivation in terms of the sex of the children and the household head.

The comparison of deprivations based on education of the heads of households provides very clear results. Table 6-8 shows that there are lower proportions of deprived children from households with highly educated heads (30.14%) compared to children from households with heads who have never attended formal education (69.93%). This finding indicates that education of head of household is a good predictor of multiple deprivations.

There are visible disparities based on religion. Table 6-8 shows that the proportion of children who are deprived in two indicators or more is almost three times bigger among children from households with non-Muslim heads (40.27%) compared with children from Muslim-headed households (15.99%).

The differences in employment status also show signs of disparities in deprivation, albeit contradictory signs and the differences is small, since the data show that children of unemployed heads are in a better situation. Table 6-8 illustrates that more children whose household head has paid employment are experiencing absolute deprivation (17.56%) than children whose household head is either unemployed or unpaid (15.99%). This pattern of disparity is uncommon, so it requires further investigation for comparison at the domain level.

Disparities are also visible when comparing deprivation based on asset ownership. Children from households with more assets are less deprived than children from households with less assets. Table 6-8 shows that when using two domains as the threshold, children from households in the lowest quintile of assets are five times more deprived compared to children from households in the highest quintile of assets.

Disparities also exist between urban and rural areas. Table 6-8 shows that more than half of the children who are living in rural areas are deprived in at least one domain. This is higher than in the urban area. In the contexts of multiple deprivations, almost 27% of children in rural areas are deprived in two domains or more while only 7% children experience a similar level of deprivation in urban areas.

Disparities are present between islands as well. Table 6-8 shows that the prevalence of children who are deprived in two domains or more outside Java is about twice as high than in Java.

6.2.3 Disparities in the Level and Intensity of Absolute Deprivation among Children

This section explores the level and intensity of absolute deprivation. Analysis of the level and intensity of absolute deprivation is an important supplement because poverty headcount, which was used in previous sections, does not indicate how severe the deprivation of the children is (Alkire and Roche, 2012).

The level absolute deprivation was investigated using the average number of deprivations experienced by the poor (De Neubourg et al., 2012a; b). The intensity of absolute deprivation was informed by the average percentage of deprivations being experienced by children facing absolute deprivation; the intensity was estimated from the number of deprivations experienced by children divided by all possible deprivations (Alkire and Roche, 2012; De Neubourg et al., 2012a; b). The adjusted headcount ratio informs absolute deprivation rates after taken account the intensity of absolute deprivation. The adjusted headcount ratio was computed based on multiplication of the headcount ratio by the intensity of absolute deprivation (Alkire and Roche, 2012; De Neubourg et al., 2012a; b). The comparison of the level and intensity of deprivation as well as the adjusted headcount ratio based on subgroup can be seen in Table 6-9.

Table 6-9. Level and intensity of absolute deprivation by individual, household, and geographical characteristics (2 Domain level items)

Subgroups		Average number of deprivations	Intensity of deprivation (2 items) (0-100 Scale)	Adjusted headcount ratio (2 items) (%)
Sex of the children	Male	1.52	45.71	7.79
	Female	1.54	45.62	8.01
Education level of household head	No schooling or primary dropout	2.10***	50.48***	22.08***
	Primary school	1.61***	45.92***	10.79***
	Junior high school	1.48***	44.55***	7.51***
	Senior high schools	1.34***	43.60***	4.03***
	University	1.19***	40.30***	2.02***
Sex of household head	Male	1.54	46.00	8.02
	Female	1.47	43.23	7.11
Religious affiliation of household head	Other religions	2.01***	49.93***	20.11***
	Islam	1.39***	43.24***	5.65***
Occupations of household head	Not working or doing unpaid work	1.47**	43.97***	7.03**
	Doing paid work	1.54**	45.98***	8.08**
Value of household assets (quintile range in Indonesian million Rp.)	Lowest (0–12.8 M)	1.79***	49.05***	13.79***
	Lower (12.8–40.8 M)	1.65***	45.56***	11.29***
	Medium (40.8–96.5 M)	1.45***	43.28***	7.20***
	Higher (96.5–222 M)	1.32***	42.21***	4.35***
	Highest (>222 M)	1.27***	43.70***	2.76***
Areas	Urban	1.23***	41.03***	2.72***
	Rural	1.70***	46.76***	13.05***
Islands	Java	1.35***	43.39***	4.70***
	Outside of Java	1.70***	46.86***	11.84***
Total		1.53	45.66	7.90

Note: *** is significant at 0.01, ** is significant at 0.05. The threshold for level and intensity of absolute deprivation is 2 domain level items.

Confirming the headcount ratio in section 6.2.2, Table 6-9 shows no significant difference in intensity deprivation among male and female children. Table 6-9 also shows no significant difference in intensity deprivation among male and female parents.

Supporting the findings of Table 6-8 on the absolute deprivation rates based on characteristics of the head of households, Table 6-9 shows that children of households with educated heads experience lower numbers of deprivations compared to children of households with uneducated heads. This finding is consistent with the intensity of deprivation and adjusted headcount ratio. Table 6-9 shows that children from households with non-Muslim heads experience higher numbers of deprivation. This finding is also consistent with the lower intensity of deprivation faced by children with Muslim heads of households. Additionally, Table 6-9 shows that children from households with an employed head face a greater number of deprivations compared with children of households with an unemployed head. The intensities of deprivation of children from households with employed heads are also higher than those of children from households with unemployed heads. However, the differences based on occupation is very small, therefore, this finding is confirmed further in section 6.2.5.

Amount of assets also contributes to the level and intensity of deprivation. As shown in Table 6-9, households with the highest assets experience the lowest numbers of deprivation (1.27 indicators) and have the lowest levels of intensity of deprivation (43.7%) and also the lowest levels of adjusted headcount ratio (7.67%). The vice versa is true for households with the lowest assets.

As illustrated in Table 6-9, there are geographic differences. Children who are living in rural areas experience more deprivation than children who are living in urban areas. Children in rural areas have a higher level of intensity of deprivation compared to children in urban areas. Additionally, children who are living in Java experience lower numbers of deprivation and lower intensity of deprivation compared to children who are living outside of Java.

6.2.4 **Disparities in Domains of Absolute Deprivation among Children**

This section focuses on disparities in the domains of absolute deprivation. There are seven observed domains: education, water, sanitation, health, shelter, information, and food. The empirical observations of disparities among those domains can be seen in Table 6-10.

Table 6-10. Individual, household, and geographic characteristics of children experiencing absolute deprivation in different domains (using age-specific indicators)

Subgroups		Proportion of children deprived in the domains of absolute deprivation						
		Shelter (%)	Water (%)	Sanitation (%)	Education (%)	Health (%)	Food (%)	Information (%)
Sex of the children	Male	7.45	18.81	10.53**	10.46**	20.92	13.06**	7.00
	Female	7.34	19.60	11.43**	9.22**	20.27	11.08**	8.41
Education level of household head	No schooling or primary dropout	27.75***	36.00***	27.91***	19.79***	25.19***	13.54***	19.91***
	Primary school	10.30***	24.02***	16.76***	13.45***	20.72***	13.23***	11.21***
	Junior high school	6.71***	19.80***	9.96***	9.89***	22.51***	12.11***	7.08***
	Senior high schools	2.55***	12.88***	4.61***	5.01***	19.65***	11.11***	3.40***
	University	1.09***	9.82***	0.87***	3.73***	17.85***	10.21***	1.61***
Sex of household head	Male	7.26**	19.72***	10.84	9.84	20.78	12.18	7.60
	Female	8.34**	15.60***	11.86	9.98	19.41	11.54	8.19
Religious affiliation of household head	Other religions	16.60***	47.95***	16.00***	15.54***	22.72***	13.23	26.71***
	Islam	5.70***	13.90***	10.04***	8.79***	20.21***	11.91	4.08***
Occupations of household head	Not working or doing unpaid work	7.70	15.82***	11.67	11.39**	19.53	12.21	6.21***
	Doing paid work	7.33	19.88***	10.83	9.55**	20.82	12.08	7.98***
Value of household assets (quintile range in	Lowest (0–12.8 M)	14.17***	25.69	18.10***	14.20**	23.68***	13.85	14.92***
	Lower (12.8–40.8 M)	10.38***	25.40	16.82***	12.46**	19.57***	13.86	11.86***
	Medium (40.8–96.5 M)	6.42***	19.29	11.42***	10.74**	20.13***	12.26	5.80***

Subgroups		Proportion of children deprived in the domains of absolute deprivation						
		Shelter (%)	Water (%)	Sanitation (%)	Education (%)	Health (%)	Food (%)	Information (%)
Indonesian million Rp.)	Higher (96.5–222 M)	3.95***	13.87	5.16***	7.39**	21.48***	10.58	4.16***
	Highest (>222 M)	2.01***	11.37	3.01***	4.53**	18.22***	9.72	1.67***
Areas	Urban	2.73***	6.18***	5.12***	7.08***	19.98***	10.82***	1.75***
	Rural	12.04***	32.15***	16.79***	12.67***	21.22***	13.38***	13.60***
Islands	Java	7.45	11.22***	8.14***	7.69***	19.51***	11.03***	2.46***
	Outside of Java	7.34	29.02***	14.45***	12.52***	21.95***	13.45***	14.05***
Total		7.40	19.19	10.97	9.86	20.61	12.11	7.68

Note: *** is significant at 0.01, ** is significant at 0.05.

The disaggregated analysis on household and individual variables provided mixed results. Table 6-10 shows that disaggregation based on the sex of the children revealed significant differences in sanitation, education and foods between male and female children. However, there are no significant differences in shelter, water, health, and information based on sex of the children. This result makes sense because most of those non-statistically significant domains, except health, were developed from household-level indicators.

The result also confirmed that education of the head of the household plays an important role in the fulfilment of child rights. Table 6-10 shows that in all of the domains, a higher proportion of deprived children came from households whose head had never attended formal education than from households with educated heads.

In the context of the sex of the head of households, there were mixed indications of deprivation. Table 6-10 shows that a higher proportion of children from households with female heads than from households with male heads are deprived in shelter. However, children from households with female heads have less deprivation in water. Additionally, there are no significant differences based on sex of the head of households in children deprivation of sanitation, education, health, food, and information.

Disparity seems to exist as well when comparing religion, as children of households who had Muslim heads seem to be better off. Table 6-10 shows that in all of the domains, larger proportions of deprivation indeed exist among children whose head of the household is non-Muslim than among children whose head of household is Muslim.

Occupation of head of households seems to provide contradictory results of deprivation at the domain level. Table 6-10 shows that children whose head of household has paid work are worse off in most of the domains than children whose head of household is not working or taking unpaid work, except in the shelter, sanitation and education domains (although only differences based on education

that statistically significant). This domain level evidence confirms that children whose head of household has a paid job have a higher proportion of absolute deprivation.

Households' assets also seem to be related to deprivation in all domains. Table 6-10 shows that children from households with more assets have a better situation compared to children from households with less assets.

There are visible disparities among geographic regions. In the context of comparison between urban and rural areas, Table 6-10 shows that in general, children in urban areas experience less deprivation compared to children in rural areas, with shelter as an exception. The deprivation of water in rural areas is more than four times as high as in urban areas. The deprivation of sanitation is more than three times as high in rural areas. Furthermore, while the deprivation in education and information is considerably low, less than 10%, the deprivation in information in rural areas is almost eight times greater than in urban areas. Disparities in the health and food domains among urban and rural areas are visible as well, albeit not very large. the deprivation of shelter in rural area is almost five times higher than urban area. Additionally, comparison based on the islands in Table 6-10 shows that in general, Java has a better situation compared to the islands outside Java. Deprivation of water supply outside Java is also almost three times higher than in Java. The deprivation of sanitation outside Java is almost two times higher than in Java. Education deprivation in Java is much lower than outside Java, although in general, the deprivation in education is considerably low. Similar to education, information deprivation in Java is much lower than outside Java, but overall considerably low. In the context of health and food, the deprivation in Java is lower than outside Java, although the disparities in the health and food domains are low. In the shelter domain, there is no differences between Java and outside Java.

6.2.5 Checking for Sensitivity and Robustness of Absolute Deprivation Thresholds

Similar to CHAPTER 5, the analysis of robustness in this section focuses on the robustness of the poverty threshold. The main strategy of the robustness test is to confirm the subgroup comparison using odd ratio based on logistic regression. To

support the robustness test, the sensitivity was tested through applying various levels of thresholds.

6.2.5.1 Sensitivity of Thresholds

In addition to testing the thresholds of the composite index of deprivation, sensitivity was also tested by assigning different standards of deprivation in the domain level (Minujin and Delamonica, 2012; Yusuf and Sumner, 2017). In this context, this thesis assigned alternative standards of water and sanitation for sensitivity tests.

This chapter identified deprivation of water as using surface water as a source of drinking water (Gordon and Nandy, 2012; Gordon et al., 2003). Conversely, deprived according to the global standard of water sources is using unimproved water sources that are not limited to surface water but also include unprotected wells, unprotected springs, tanker trucks, and bottled water (WHO and UNICEF, 2017). A global standard was not used because there are issues regarding the use of unimproved water sources as an indicator of water deprivation. In Indonesia, bottled water is a popular drinking water source and mainly consumed by people in urban areas and in the middle to higher income population (Warburton, 2011). The IFLS+ dataset shows that more than 30% of the Indonesian population uses bottled water as the main source of drinking water, which is a percentage even larger than the percentage of the population using other sources of drinking water. Those people may use bottled water because other water sources, such as piped water, are not available or need further treatment before the water can be considered safe for drinking. However, since bottled water is considerably expensive according to the local standard, the poorer population prefers to use other water sources with some treatment. Therefore, using bottled water as a source of drinking water is not good indicator of poverty.

This chapter identifies deprivation in sanitation as based on the severe standard of not having access to a toilet. In contrast, the global standard uses unimproved sanitation (WHO and UNICEF, 2017). The data show that 31% of children use unimproved sanitation facilities which is higher than the proportion of children who do not have access to toilet facility at their house (10.97%).

Integrating alternative water and sanitation into alternative child poverty measures informs different levels of relative deprivation. A comparison of the sensitivity of absolute deprivation thresholds that compares the original indicator standards that have been applied in this thesis and the global standards can be consulted in *Figure 6-6*.

Figure 6-6. Sensitivity of absolute deprivation's thresholds

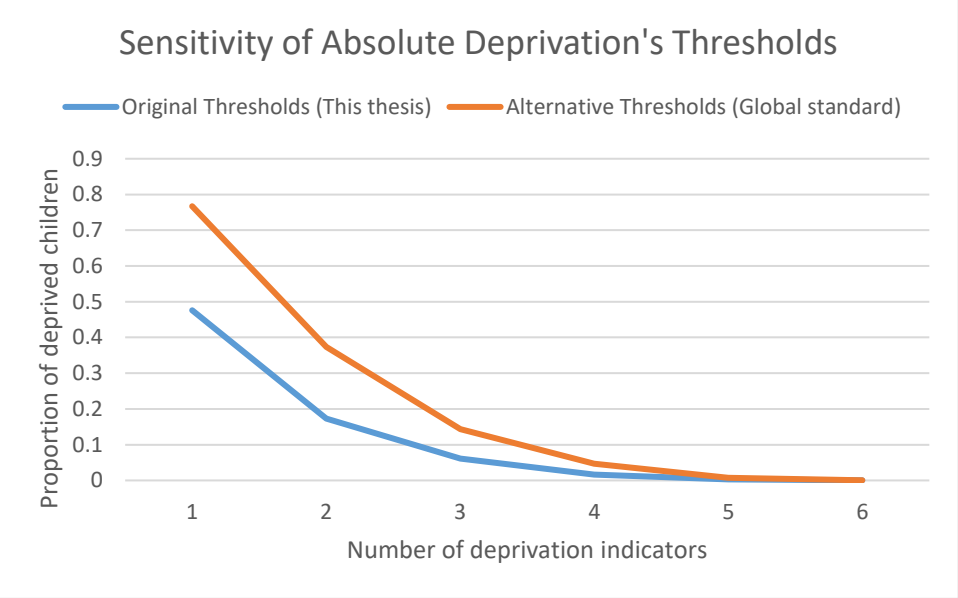


Figure 6-6 shows that the global standards represent a higher proportion of poor children compared to the original standards. 77% of children are deprived in one indicator threshold and 37% in two indicator thresholds according to the global standards. These results are higher than the estimates of thesis (48% and 17% respectively).

6.2.5.2 Robustness Tests

Investigating the factors associated with the probability of children being poor also helped to confirm the robustness of the subgroup comparison of absolute deprivation. The comparison of the characteristics of the poor children per the various measures helped to confirm the estimates of the poverty rates shown in Table 6-8. The analysis also helped to capture the profile of child poverty according to absolute deprivation. The odds ratio of the factors associated with the absolute deprivation were tested using the logistic regression that can be seen in Table 6-11.

Table 6-11. Factors associated with absolute deprivation

	(1) Deprived in one indicator or more	(2) Deprived in two indicators or more
Living in urban area	0.466***	0.317***
	(0.0184)	(0.0195)
Living in Java	0.786***	0.653***
	(0.0308)	(0.0381)
Primary school	0.667***	0.449***
	(0.0689)	(0.0489)
Junior high school	0.506***	0.293***
	(0.0544)	(0.0342)
Senior high schools	0.340***	0.181***
	(0.0359)	(0.0214)
University	0.337***	0.146***
	(0.0395)	(0.0233)
Female head of household	0.956	0.871
	(0.0591)	(0.0743)
Muslim head of households	0.469***	0.329***
	(0.0230)	(0.0186)
Employed	1.085	1.084
	(0.0600)	(0.0849)
Quintile of household assets (lowest asset as reference group)		
Lower	0.864**	0.751***
	(0.0496)	(0.0510)
Medium	0.633***	0.480***
	(0.0369)	(0.0351)
Higher	0.553***	0.358***
	(0.0328)	(0.0301)
Highest	0.480***	0.282***
	(0.0299)	(0.0303)
Constant	7.925***	4.722***
	(0.967)	(0.658)
Observations	21,307	21,307

Note: *** is significant at 0.01, ** is significant at 0.05, * is significant at 0.1
(Standard errors of statistics in parentheses).

Table 6-11 shows that children who are deprived in one indicator and children who are deprived in two indicators have similar characteristics. Children who are living in urban areas are less likely to experience absolute deprivation. Additionally, children living in Java are less likely to be deprived. Furthermore, children whose heads of household are Muslim are less likely to experience absolute deprivation. When other variables are controlled, there is no relationship between occupation of head of household and deprivation. Assets, however, are an important predictor for absolute deprivation since children whose households have more assets are less likely to experience absolute deprivation.

6.3 Conclusion

This chapter investigated absolute deprivation among children in Indonesia. The human rights-based approach was used, so the Bristol Method was selected as the most appropriate measure. In addition to generating estimates of the child poverty rates, the set of indicators were evaluated based on reliability (internal consistency, discrimination, and difficulty tests), validity, and additivity.

The reliability test showed that the measure does not necessarily have strong internal consistency, and two items (health and nutrition) seem to be problematic, as both have a very low discrimination score according to item response theory (IRT). Additionally, those two items (health and nutrition) are not valid, although to some extent, the items are additive (with only a minor additivity problem). Since this chapter focused on evaluating the existing measures, no items were dropped.

The estimates confirmed that the selection of thresholds is significant aspect of absolute deprivation. The estimates showed that almost half of children in Indonesia are deprived of at least one indicator. On the other hand, this chapter estimated that more than 15% of children experience absolute deprivation using the two-domains threshold.

Domain-level estimates indicated that the largest proportions of deprived children were deprived in three domains: health, water, and sanitation. If one of those

domains were to be excluded from the estimates of the composite index, the proportion of children experiencing absolute deprivation would significantly drop.

Based on both composite indices and domain-level analysis, this chapter showed that regional disparity exists. The estimations show disparities in the areas that are visible in the comparison of the headcount ratio between urban and rural areas and also in the comparison between children living in Java and outside Java.

Household characteristics were important in helping to identify the nature of deprivation. The results showed that the characteristics of households play a significant role in predicting deprivation. Household assets also seemed to contribute to deprivations in both the domain and composite indices. The subgroup comparison also showed that disparity exists in the level and intensity of absolute deprivation.

CHAPTER 7. MULTIDIMENSIONAL CHILD POVERTY: RELATIVE DEPRIVATION

Chapter Summary

This chapter reports the estimated multidimensional child poverty in Indonesia from relative deprivation perspectives along with the individual, household, and geographical characteristics.

- This chapter reports the methods (section 7.1) and estimated relative deprivation among children in Indonesia (section 7.2).
- Since previous studies of relative deprivation in Indonesia are limited, and the data for socially perceived necessities are not available, this thesis identified relative deprivation domains and indicators using the qualitative findings of past research on Indonesia.
- The reliability, validity, and additivity of those items were investigated.
    - Items that were not reliable and valid were excluded.
    - No items were excluded on the basis of additivity tests.
    - Most retained items were household indicators as the majority of individual indicators failed the tests.
- Two approaches were applied to create composite indices of relative deprivation: raw sum score (RSS) and item response theory (IRT).
- A greater proportion of children were deprived based on raw sum score (31.86%) than based on item response theory (25.74%).
- The patterns of relative deprivation among sub-groups were similar to those observed by estimating absolute deprivation:
    - Children from more developed regions such as urban areas and Java were less deprived than children from rural areas and outside Java.
    - Children from households with more assets were less deprived than children from households with fewer assets.
    - Children with educated and also Muslim heads of household were less deprived compared to children with less educated and non-Muslim heads of household.
- Relative deprivation based on IRT was selected as the most robust estimate to compare to other child poverty measures.

7.1. Strategy for Developing a Relative Deprivation Measure

This chapter seeks to adapt Townsend's (1979; 1987; 1993) relative deprivation approach to measure child poverty in the Indonesian context. Based on the research objective, the measurement and analysis strategy of this chapter incorporated the following approaches.

The first step was the selection of the indicators. Since relative deprivation is context dependent, which means that it varies across time and space, and since there no previous studies of relative deprivation in Indonesia have focused on children, this chapter had to develop its own set of measurement indicators. Socially perceived necessities are regarded as the gold standard to identify relative deprivation indicators (Mack and Lansley, 1985; Main, 2013; Main and Bradshaw, 2014). Due to lack of data on the subjective views of Indonesian people on necessities, this chapter derived context-specific indicators from the relevant literature. In line with Guio et al. (2012), the validity, reliability, and additivity tests were conducted to select the most robust indicator items.

The second step was the creation of the index. The selected items that passed the validity, reliability, and additivity tests were combined and aggregated into composite indices of relative deprivation. Two approaches were used to generate composite indices: raw sum score and item response theory.

The third step was the identification of thresholds to distinguish which children are experiencing relative deprivation. The strategy for creating the index and identifying the thresholds is outlined in section 7.1.2.

The fourth step was empirical analysis. A comparison of the headcount ratios from both composite indices (based on raw sum score and based on item response theory's factor score) was carried out to provide general overviews of the extent of child poverty. Then a more detailed analysis of the nature of relative deprivation among children was executed through disaggregating the headcount ratio based on geographic and household characteristics. Additionally, the average level and intensity of relative deprivation was also described based on the characteristics. Level of deprivation informed the average number of deprivations experienced by

the children. Intensity of deprivation informed the average percentage of number of deprivations against total number deprivation indicators. The differences within each subgroup of the individual, household, and geographic characteristics were tested using ANOVA and supported by robustness tests using logistic regression. More detailed overviews of the extent and nature of relative deprivation among children are discussed in section 7.2.

7.1.1 Selecting Relative Deprivation Indicators

There is no widely used set of relative deprivation indicators. One of the fundamental principles of relative deprivation is that the indicators that are used should reflect the observed society. In previous relative deprivation studies (Fahmy et al., 2007; Guio et al., 2012; 2018; 2017; 2016; Mack and Lansley, 1985; Main, 2013; Main and Bradshaw, 2014; Nandy and Pomati, 2015; Townsend, 1979; 1993), the indicators have varied across society and been relevant to each study's unique context. Therefore, the existing relative deprivation scales were not applicable to this thesis, since they were developed based on the situation of different societies. Consequently, it was necessary to develop a relative deprivation scale that fit with the Indonesian context.

The relative deprivation scale had to incorporate the domains and indicators used to capture the position of children relative to the commonly acceptable standards of Indonesian society. Public views are important aspects of the identification of the acceptable standards. The strategy to identify public views on child poverty is to undertake primary research (qualitative, quantitative, or mixed methods). This additional research was outside the scope and skills of the researcher in this thesis, so methods using existing survey data were applied instead.

Since the existing quantitative data about public perceptions of necessities in Indonesia are limited and not available in the IFLS+ dataset, this thesis unable to determine identify relative deprivation indicators and domains based on the perception of the survey participants. For example, this thesis was unable to use the method applied by previous studies (Main, 2013; Main and Bradshaw, 2014) of asking participants to justify whether they think certain groups of items are

necessities or not; namely, the thesis did not mark certain items as suitable or unsuitable based on certain levels (i.e. 50%) of survey participants considering those items as necessities.

Another potential strategy that adopts the proportional approach does exist. This strategy identifies the relative deprivation indicators based on theory and data availability then confirms the indicators by examining how the population rates them (Fahmy et al., 2007). When more than 50% of the population possess goods or services or participates in specific activities, this strategy assumes that those goods, services, and activities are the norm and can be considered as necessities in the society (Fahmy et al., 2007). This thesis did not use that strategy because the variation between geographic regions would have caused substantial inconsistencies between the lists of indicators in each region.

As a substitute for the quantitative survey data of socially perceived necessities, this chapter captured public views through examining previous studies that have collected children's and adult's perspectives on the experiences of child poverty. The basic list of relative deprivation indicators for this chapter was developed based on the domains and items identified through the qualitative findings from previous studies in Indonesia (Bessell, 2009; Reality Check Approach Plus, 2015a; Reality Check Approach Plus and UNICEF Indonesia, 2017; SMERU, 2011; Wisor et al., 2015). Although those previous studies were not dedicated to investigating relative deprivation, their collection of qualitative information allowed this chapter to capture data on people's views of the domains of poverty and child poverty within the Indonesian context. Obtaining information from studies that were conducted in various location in Indonesia thus helped to improve the credibility of the potential indicators.

The indicators derived from qualitative studies (see Table H-1 in Appendix H) were compared to the items available in the IFLS 5 and IFLS East datasets, and those indicators unsupported by either dataset were excluded. Based on this process, the domains and subdomain level indicators were as follows (Table 7-1). The corresponding data sources of the indicators can be seen in Table H-2.

Table 7-1. Preliminary list of relative deprivation indicators

Domains	Subdomain level indicators for 'relative deprivation'	Level of the data	Age groups
Information and Communication	• Children do not have a mobile phone (*No mobile phone*) • Children do not have internet access at home (*No internet access*) • Children do not have access to television (*No TV*)	Household (except mobile phone which is individual)	13-17 5-17 3-17
Child Labour	• Children participate in paid work (Paid work) • Children participate in non-paid work for more than the acceptable number of hours (*Unpaid work*)	Individual	0-17
Education	• Children of school age have never been to school or are not currently attending school (*Did not go to school or finish primary education*)	Individual	7-17
Food and Nutrition	• Children are unable to eat three times a day (*Eating less three times per day*) • Children do not have access to sources of protein daily *(Insufficient protein*) • Children are more than three standard deviations below the international reference population for stunting - height for age (*Stunting*) • Children are more than three standard deviations below the international reference population for underweight-weight for age (*Underweight*) • Children are more than three standard deviations below the international reference population for wasting -weight for height (*Wasting*)	Individual	0-15 (Exclude under 1 y/o who are breastfeeding) *Age 16-17 were not covered because the data is not available.* 0-4 (anthropometric)
General Health Status	• Children whose health condition leaves them feeling badly on a daily basis (*Feeling bad about health condition*) • Children have missed significant activity days because of poor health in the last 4 weeks (*Missed days because of poor health*) • Children have spent a number of days in bed because of poor health in the last 4 weeks (*Spent days in bed because of poor health*) • Children's health condition is felt worse compared to their health condition 12 months ago (*Perceived deterioration of health*)	Individual	0-15 *Age 16-17 were not covered because the data is not available.*
Health Care	• Children did not receive any immunisations against disease (*Did not receive immunisation*) • Children did not receive health treatment for a recent illness involving an acute	Individual	Under 5: 0-4 (Immunization) 0-15 (treatment)

Domains	Subdomain level indicators for 'relative deprivation'	Level of the data	Age groups
	respiratory infection or diarrhoea (*Illness untreated*)		*Age 16-17 were not covered because the data is not available*.
Social	• Children are unable to meet their father and mother frequently (*Infrequent contact with parents*)	Individual	0-12
Autonomy	• Children are excluded from decision making in the household (*Excluded from decision-making*)	Individual	13-17
Shelter	• Children are living in a house has inadequate roofing (*Inadequate roofing*) • Children are living in a house with inadequate flooring (i.e. a mud or dung floor) (*Inadequate flooring*) • Children's house lacks adequate ventilation (*Inadequate ventilation*) • Children's house cooking room is also the sleeping room (*Cook in same place for sleep*) • Children's house has 4 or more people per room (*Overcrowded house*)	Household	0-17
Environmental Health and Hygiene	• Children's house is surrounded by human and animal waste (*House is surrounded by waste*) • Children's house is surrounded by pile of trash (*House is surrounded by trash*) • Children's house is surrounded by dirty stagnant water (*House is surrounded by stagnant water*) • Children is living in house without a moderately sized yard which well maintained (*House without well-maintained yard*)	Household	0-17
Water	• Children use surface water for their source of drinking water (*Using surface water for drinking*) • Children's house is more than 200 meters away from drinking water sources (*Water sources over 200 meters away*)	Household	0-17
Sanitation	• Children do not have access to improved sanitation (*Lack access to improve sanitation*)	Household	0-17
Energy	• Household does not have access to electricity (*House without electricity*) • Household does not use clean cooking fuel (electricity, gas, or kerosene) (*Household does not use clean cooking fuel*)	Household	0-17

Domains	Subdomain level indicators for 'relative deprivation'	Level of the data	Age groups
Geographic access and transportation	• Household does not own a transport vehicle (*Household does not have transport vehicle*) • Children lack access to public transportation that stops at their village (*Village inaccessible by public transport*)	Household	0-17
Safety	• Children are living in neighbourhood that perceived as unsafe (*Neighbourhood perceived as unsafe*)	Community	0-17

Note: The abbreviations of indicators' name are within the parentheses (in *italic*)

Table 7-1 shows that identification based on previous studies captures a wide range of the preliminary list's relative deprivation domains. The domains are in line with many issues covered in the UNCRC. However, it needs to be acknowledged that many necessities cannot be covered by the data. For example, previous studies inform that children enjoy holidays, playing with friends, attending birthday parties and going to picnic (Reality Check Approach Plus and UNICEF Indonesia, 2017; SMERU, 2011). The interaction that made children enjoy may also be related to the material goods, such as receiving gifts. Referring the concepts proposed by Townsend (Townsend, 1979; 1987), lacking any social interactions above, with the assumption that those are considered norms in society, can be considered as social deprivation. Unfortunately, IFLS only able to cover social interaction with families through the indicator of frequencies of meeting with parents, not social interaction with friend and communities. Therefore, social interaction with friends and communities was excluded from the preliminary list of indicators.

As illustrated in Table 7-1, the domains were translated into preliminary sets of sub-domain level indicators that were then used as observation items for further testing to identify the final set of indicators. Each item covered different levels of information based on data structures. The table indicates whether the items the items provide information at the individual, household, or community level. The tests for selecting indicators examined reliability, validity, and additivity. Internal consistency tests and item response theory were used to carry out reliability tests. Logistic regression was used for the validity test. ANOVA's main effect and interaction effect analyses were used for the additivity test. Indicators that were not reliable and valid were excluded.

Items correspond to different ages. The age was identified based on the theory as well as the policy and social norm in Indonesia. However, because of the data limitation, some of the age groups for some specific indicators were excluded. For example, ages 16-17 were excluded from the analysis of health because the data on health indicators only cover 0-15 years old. Because each item incorporates different ages, the testing was carried out based on age groups. The sets of indicators in each age group correspond with the indicators most relevant to the age group covered. The age groups for age-specific analysis are 0-4, 5-6, 7-12, 13-15, and 16-17. However, to capture the general information of all children, an analysis of all children age 0-17 was also carried out.

7.1.1.1 Reliability Tests

Three reliability tests were performed to identify the most appropriate items to retain from this list. These tests were for internal consistency (see subsection 7.1.1.1.1), item discrimination and difficulty (using the item response theory, see subsection 7.1.1.1.2), and item validity (see subsection 7.1.1.2). Having selected only those items which pass all three of these tests, a final check of item consistency and additive value was conducted to define the final set of included items (see subsection 7.1.1.4).

7.1.1.1.1 Internal Consistency Test for Candidate of Relative Deprivation Items

The main focus of reliability tests is internal consistency among a set of indicators. The internal consistency test conducted in this test had two stages. The first stage of the internal consistency test was a preliminary test conducted on all items (preliminary list of relative deprivation indicators) in the early stage of the process of selecting indicators. As in CHAPTER 6, the internal consistency test was carried out using alpha coefficients and omega coefficients. The results of the preliminary internal consistency test can be seen in Table 7-2. The second stage of the internal consistency test was conducted only for items that passed the preliminary internal consistency test, the item response test, and the validity test (see subsection 7.1.1.4).

Table 7-2. Preliminary test of internal consistencies of candidate of relative deprivation items

	Age Groups											
	0-17		0-4		5-6		7-12		13-15		16-17	
	Alpha	Omega	Alpha	Omega	Alpha	Omega	Alpha	Omega	Alpha	Omega	Alpha	Omega
No mobile phone	0.572	0.598	na	na	na	na	**0.590**	**0.621**	0.620	0.645	0.620	0.645
No internet access	**0.581**	0.603	na	na	**0.590**	**0.609**	0.576	0.603	0.610	0.639	0.610	0.639
No TV	0.536	0.566	0.560	0.590	0.535	0.561	0.548	0.573	0.619	0.636	0.619	0.636
Paid work	0.577	**0.606**	na	na	0.579	**0.608**	**0.590**	**0.618**	0.649	**0.669**	na	na
Unpaid work	**0.598**	**0.612**	na	na	**0.594**	**0.619**	**0.620**	**0.629**	**0.679**	**0.685**	na	na
Did not go to school or finish primary education	0.570	0.596	na	na	na	na	0.584	0.607	0.629	0.651	0.629	0.651
Eating less than three times per day	**0.587**	**0.607**	**0.619**	**0.637**	**0.593**	**0.612**	**0.602**	**0.618**	**0.656**	**0.670**	na	na
Insufficient protein	0.573	0.599	0.595	0.625	0.575	0.601	0.585	0.609	0.648	0.667	na	na
Stunting	0.577	0.602	0.596	0.625	na	na	na	na	na	na	na	na
Underweight	0.576	0.598	0.593	0.620	na	na	na	na	na	na	na	na
Wasting	0.577	0.604	0.599	0.628	na	na	na	na	na	na	na	na
Feeling bad about health condition	0.573	0.598	0.595	0.624	0.575	0.600	0.587	0.600	0.650	0.661	na	na
Missed days because of poor health	0.577	0.600	**0.606**	**0.629**	**0.581**	0.604	0.587	0.608	0.649	0.664	na	na
Spent days in bed because of poor health	0.575	0.600	0.597	0.627	0.579	**0.608**	0.586	0.597	0.649	0.657	na	na
Perceived deterioration of health	0.575	0.601	0.596	0.626	0.578	**0.606**	0.586	0.599	**0.651**	0.658	na	na
Did not receive immunisation	0.576	0.601	0.592	0.620	na	na	na	na	na	na	na	na
Illness untreated	**0.582**	**0.606**	**0.609**	**0.635**	**0.588**	**0.614**	**0.595**	**0.618**	**0.653**	**0.671**	na	na
Infrequent contact with parents	0.576	**0.604**	0.599	**0.630**	**0.581**	**0.609**	**0.590**	**0.614**	**0.654**	**0.671**	na	na
Excluded from decision-making	**0.592**	**0.614**	na	na	na	na	na	na	**0.659**	**0.672**	**0.650**	**0.676**
Inadequate roofing	**0.618**	**0.620**	**0.639**	**0.645**	**0.624**	**0.626**	**0.633**	**0.633**	**0.685**	**0.685**	**0.688**	**0.696**
Inadequate flooring	0.559	0.583	0.582	0.608	0.560	0.584	0.570	0.591	0.638	0.654	0.625	0.658
Inadequate ventilation	0.563	0.592	0.587	0.618	0.564	0.593	0.574	0.600	0.642	0.661	0.632	0.668
Cook in same place for sleep	0.572	0.598	0.595	0.624	0.574	0.599	0.585	0.608	0.647	0.664	0.638	0.673

	Age Groups											
	0-17		0-4		5-6		7-12		13-15		16-17	
	Alpha	Omega	Alpha	Omega	Alpha	Omega	Alpha	Omega	Alpha	Omega	Alpha	Omega
Overcrowded house	0.574	0.598	0.597	0.625	0.577	0.603	0.585	0.607	0.648	0.665	0.637	0.671
House surrounded by waste	0.559	0.587	0.583	0.613	0.551	0.580	0.571	0.597	0.638	0.657	0.625	0.661
House surrounded by trash	0.561	0.590	0.585	0.616	0.557	0.586	0.573	0.599	0.639	0.658	0.626	0.663
House surrounded by stagnant water	0.567	0.595	0.592	0.622	0.565	0.594	0.580	0.606	0.645	0.663	0.628	0.664
House without well-maintained yard	0.570	0.596	0.594	0.621	0.570	0.596	0.584	0.607	0.645	0.662	**0.644**	0.672
Using surface water for drinking	0.548	0.580	0.571	0.604	0.548	0.579	0.560	0.588	0.626	0.648	0.616	0.654
Water sources over 200 meters away	0.572	0.599	0.594	0.623	0.574	0.602	0.585	0.609	0.648	0.668	0.636	0.672
Lacks access to improved sanitation	0.525	0.568	0.549	0.591	0.525	0.566	0.536	0.575	0.611	0.639	0.597	0.643
House without electricity	0.557	0.577	0.581	0.602	0.551	0.570	0.569	0.587	0.635	0.647	0.625	0.653
Household does not use clean cooking fuel	0.530	0.569	0.557	0.594	0.529	0.566	0.540	0.575	0.612	0.638	0.600	0.644
Household does not have transport vehicle	0.538	0.575	0.561	0.598	0.537	0.573	0.551	0.584	0.623	0.647	0.606	0.648
Village inaccessible by public transport	0.575	0.600	0.601	0.627	0.575	0.600	0.588	0.610	0.648	0.665	0.642	0.676
Neighbourhood perceived as unsafe	0.578	**0.609**	**0.601**	**0.635**	0.579	**0.613**	**0.591**	**0.622**	**0.651**	**0.675**	**0.641**	**0.685**
Total	0.578	0.603	0.600	0.628	0.579	0.605	0.589	0.613	0.650	0.668	0.639	0.673

Note: The alpha and omega scores if the items were deleted are shown in bold. ‘na’ means that the items are not applicable to the corresponding age groups.

Table 7-2 shows that the alpha and omega scores are below 0.7, which means that all the items have low internal consistency. The omega estimates are higher than the alpha estimates because they do not assume unidimensionality. The internal consistency (alpha and omega coefficients) of the age-specific item analysis (age 0-4, 5-6, 7-12, 13-15, 16-17) is higher than the internal consistency for all ages combined (age 0-17). Although internal consistency is still low, this result indicates that age-specific estimates are more appropriate. The low internal consistency was expected because the items in Table 7-2 are only the candidate relative deprivation items before the items were narrowed down further.

Table 7-2 also indicates that removing certain items would enhance internal consistency (improve the alpha and omega scores). The alpha and omega scores 'if deleted' was estimated based on the scenario of the estimation of alpha and omega scores of all items except those corresponding items in the left column of Table 7-2. Removing items would improve internal consistency if alpha and omega scores 'if deleted' are higher than alpha and omega of the total items. The items that would improve internal consistency if deleted are highlighted in bold. The result of internal consistency will be combined with the results of other tests to develop a reliable and valid set of items.

7.1.1.1.2 Item Response Test for Candidate of Relative Deprivation Items

Unlike in CHAPTER 6, which used the item response theory (IRT) test to evaluate the existing indicators, the use of the IRT in this chapter serves two purposes. The first is to further check reliability to help in the selection of the indicators (Guio et al., 2012; 2018; 2017; 2016). The second purpose is for aggregation to create the composite score of relative deprivation[3]. The main focus on this subsection is the use of IRT to select indicators.

Using a two-parameter logistic model (2PL), the item response test was carried out based on the parameter of item discrimination (to find justification for selection of items) and item severity (to acknowledge children's differences in chance of being

[3] Creating composite score using IRT was commonly used in education (Cook and Eignor, 1985; 1989; Moghadamzadeh et al., 2011) and psychology (Lalor et al., 2016).

deprived of each item). As explained in CHAPTER 6 (subsection 6.1.1.1.2), the levels of item discrimination coefficients indicate the extent to which any one deprivation item can distinguish children who experience relative deprivation in general. The item severity coefficients show the level of severity of deprivation when 50% of children are deprived in the items.

To improve the reliability of the construct, items with discrimination and severity coefficients beyond a certain range of thresholds should be excluded from the estimation. However, the issue is that there is no agreement over the appropriate threshold. This subsection discusses discrimination and difficulty coefficients in turn.

Referring to Baker (2001) and Hambleton et al. (1991), higher discrimination coefficients indicate that the items have more ability to discriminate children who are experiencing relative deprivation. Baker (2001) sought to provide a guideline for the range of the estimates of item discrimination coefficients as follows (Table 7-3).

Table 7-3. Range of item discrimination coefficients

Verbal Label	Range of Values
None	0
Very Low	0.01-0.34
Low	0.35-0.64
Moderate	0.65-1.34
High	1.35-1.69
Very High	More than 1.7
Perfect	+ Infinity

Source: Baker (2001)

Other studies of relative deprivation (Guio et al., 2012; 2018; 2017; 2016) have treated items with discrimination coefficients lower than 0.4 as unreliable. This would be viewed as a low value in Baker's range. Since 0.4 seems to be a moderate level of acceptable threshold, the items with discrimination coefficients of less than 0.4 were excluded from the estimation in this chapter. The estimates of discrimination coefficients can be consulted in Table 7-4.

Table 7-4. Discrimination coefficients for candidate relative deprivation items

	All	0-4	5-6	7-12	13-15	16-17
Inadequate roofing	-0.463	-0.408	-0.491	-0.494	-0.489	-0.500
Unpaid work	-0.216	na	-0.187	-0.312	-0.351	na
Eating less than three times per day	-0.009	-0.132	-0.019	0.051	0.155	na
Days missed because of poor health	0.040	-0.003	0.092	0.146	0.287	na
Illness untreated	0.061	0.099	0.017	0.037	0.137	na
Excluded from decision making	0.080	na	na	na	0.234	0.262
Neighbourhood perceived as unsafe	0.096	0.294	0.200	-0.074	0.027	-0.718
Feels bad about health condition	0.210	0.246	0.257	0.236	0.262	na
Stunting	0.238	0.390	na	na	na	na
Spent days in bed because of poor health	0.266	0.253	0.098	0.368	**0.425**	na
Perceived deterioration of health	0.304	0.327	0.229	0.349	0.245	na
Did not receive immunisation	0.317	**0.556**	na	na	na	na
House without well-maintained yard	0.359	**0.404**	0.372	0.304	0.347	**0.443**
Wasting	0.378	**0.506**	na	na	na	na
Infrequent contact with parents	**0.405**	**0.464**	0.265	0.367	0.371	0.000
Underweight	**0.509**	**0.668**	na	na	na	na
Village inaccessible by public transport	**0.512**	**0.448**	**0.564**	**0.551**	**0.573**	**0.505**
No internet access	**0.524**	na	0.210	**1.173**	**2.114**	**1.929**
Paid work	**0.534**	na	**1.406**	0.355	**0.557**	na
House surrounded by stagnant water	**0.566**	**0.535**	**0.614**	**0.549**	**0.524**	**0.635**
Inadequate ventilation	**0.569**	**0.592**	**0.554**	**0.559**	**0.524**	**0.443**
Cook in same place for sleep	**0.614**	**0.597**	**0.705**	**0.651**	**0.632**	0.322
No mobile phone	**0.742**	na	na	**1.154**	**1.553**	**1.484**
House surrounded by trash	**0.746**	**0.764**	**0.802**	**0.677**	**0.697**	**0.689**
Did not go to school or finish primary education	**0.857**	na	na	**0.749**	**1.142**	**1.183**
Water sources over 200 meters away	**0.859**	**0.916**	**0.720**	**0.847**	**0.814**	**0.831**
House surrounded by waste	**0.938**	**0.947**	**1.109**	**0.883**	**0.861**	**0.756**
Insufficient protein	**0.989**	**0.818**	**1.196**	**1.234**	**1.004**	0.000
Overcrowded house	**1.067**	**1.134**	**0.932**	**1.028**	**0.957**	**1.027**
Using surface water for drinking	**1.638**	**1.687**	**1.552**	**1.681**	**1.518**	**1.388**
Household does not have transport vehicle	**1.653**	**1.691**	**1.744**	**1.681**	**1.419**	**1.518**
Inadequate flooring	**1.679**	**1.747**	**1.571**	**1.653**	**1.500**	**1.584**
Lacks access to improved sanitation	**1.850**	**1.967**	**1.867**	**1.827**	**1.634**	**1.411**
Household does not use clean cooking fuel	**2.385**	**2.190**	**2.473**	**2.743**	**2.247**	**1.787**
No TV	**3.108**	**2.937**	**3.598**	**3.264**	**3.103**	**2.715**
House does not have electricity	**3.768**	**3.557**	**4.673**	**3.546**	**3.831**	**4.180**

Note: Items with a discrimination coefficient more than 0.4 are in bold. All estimates are significant to 0.001 level. 'na' means that the items are not applicable to the corresponding age groups.

Table 7-4 shows that most of the items have high discrimination parameters and that discrimination is reasonably consistent across age groups. However, there are some variations of discrimination coefficients across age groups. When the items with discrimination coefficients less than 0.4 are removed, each age group has a different (but overlapping) list of retained items.

Considering severity thresholds, selecting items with severity coefficients in the range - (-3 to +3) has been applied in poverty studies (Guio et al., 2018; 2017). Previous studies have shown that the deprivation level of items considered as a norm in the society can be very low (Fahmy et al., 2007; Guio et al., 2012; 2018; 2017; 2016). That means the severity parameters of those items would be high and, if the range of severity coefficients is too narrow, important items then would not pass the test. Additionally, the severity test is not the only test applied to select relative deprivation indicators, so exclusion on this basis alone is not appropriate. Therefore, this chapter uses the range of severity coefficients -3 to +3. The severity coefficients for these items can be consulted in Table 7-5.

Table 7-5. Severity coefficients for candidate relative deprivation items

	All	0-4	5-6	7-12	13-15	16-17
Eating less than three times per day	-124.1	-6.767	-51.073	17.415	8.206	na
House without well-maintained yard	**0.221**	**0.271**	**0.174**	**0.189**	**0.210**	**0.359**
Lacks access to improved sanitation	**0.614**	**0.592**	**0.612**	**0.560**	**0.743**	**0.824**
Household does not use clean cooking fuel	**0.691**	**0.789**	**0.720**	**0.577**	**0.717**	**0.740**
Household does not have transport vehicle	**0.702**	**0.717**	**0.666**	**0.630**	**0.787**	**0.926**
Inadequate roofing	**0.939**	**1.069**	**0.873**	**0.804**	**1.064**	**0.884**
No internet access	**0.995**	na	4.071	**-1.577**	**0.383**	**0.998**
No TV	**1.231**	**1.207**	**1.207**	**1.181**	**1.332**	**1.415**
Using surface water for drinking	**1.318**	**1.331**	**1.352**	**1.226**	**1.416**	**1.593**
House without electricity	**1.848**	**1.915**	**1.675**	**1.811**	**1.929**	**2.027**
Inadequate flooring	**2.276**	**2.251**	**2.338**	**2.241**	**2.466**	**2.497**
House surrounded by waste	**2.663**	**2.683**	**2.237**	**2.783**	**2.855**	3.263
House surrounded by trash	**2.906**	**2.903**	**2.645**	3.100	3.043	3.358
Village inaccessible by public transport	3.092	3.404	**2.839**	**2.915**	**2.853**	3.273
Inadequate ventilation	3.252	3.106	3.292	3.304	3.626	4.059
House surrounded by stagnant water	3.621	3.772	3.323	3.669	4.044	3.441
Did not go to school or finish primary education	3.720	na	na	3.905	**1.597**	**2.535**
Water sources over 200 meters away	3.762	3.559	4.386	3.760	4.060	3.919
No mobile phone	4.113	na	na	8.248	**0.697**	**1.580**
Insufficient protein	4.223	4.428	3.933	3.633	4.465	na
Overcrowded house	4.498	4.392	5.212	4.443	4.814	5.218
Cook in same place for sleep	5.056	5.020	4.470	4.764	5.332	9.705
Unpaid work	5.230	na	10.153	**2.109**	**2.501**	na
Infrequent contact with parents	5.431	5.387	8.087	4.933	5.633	na
Did not receive immunisation	8.193	**2.415**	na	na	na	na
Underweight	8.536	4.895	na	na	na	na
Paid work	9.506	na	5.512	12.626	7.151	na
Feels bad about health condition	10.047	6.633	7.880	9.667	10.361	na
Perceived deterioration of health	11.124	9.877	14.365	9.373	14.897	na
Wasting	12.623	7.286	na	na	na	na
Stunting	13.791	5.424	na	na	na	na
Spent days in bed because of poor health	13.887	13.371	38.276	10.062	9.738	na
Excluded from decision making	23.889	na	na	na	**-2.161**	**-0.885**
Illness untreated	30.621	15.986	110.965	50.799	15.290	na
Missed days because of poor health	47.481	-516.0	19.974	14.713	8.788	na
Neighbourhood perceived as unsafe	52.545	17.144	25.070	-68.53	182.323	-8.354

Note: Items with severity coefficients between -3 and 3 in bold. All estimates are significant to 0.001 level. 'na' means that the items are not applicable to the corresponding age groups.

The severity and discrimination coefficients were used to remove indicators. In general, there were some consistencies between item discrimination and severity coefficients. Table 7-4 and Table 7-5 show that some items with very high severity parameters have very low discrimination, for example, the item of “illness untreated”. This means that the majority of children who are deprived in items with a high level of severity are less likely to experience deprivations in other items. Thus when children deprived in items that have very high severity coefficients, they are not necessarily deprived in other items. Interestingly, Table 7-4 and Table 7-5 also show that some items with very low severity coefficients also have low discrimination coefficients. The item “eating less than three times per day” is one example. This situation confirmed the selection of the discrimination and severity coefficients’ thresholds since the majority of items that would be excluded based on the level of severities (lower than -3 or higher than +3 should be excluded) would also be excluded using the discrimination standards (less than 0.4 should be excluded).

7.1.1.2 Validity of the Candidate of Relative Deprivation Items

Validity tests aim to ensure that the items are measuring what they intend to measure. It is crucial to ensure that each item is significantly correlated to the covariates that influence the relative deprivation items. Townsend (Townsend, 1979; 1993) observed that relative deprivation is a consequence of lack of monetary resources. According to the literature (Fahmy et al., 2007; Gordon and Nandy, 2012; Guio et al., 2012; 2018; 2017; 2016), monetary resources are represented by various indicators such as expenditure, assets, and income. This chapter uses log equivalised expenditure, log equivalised assets, and log of income as key validators. Only items that were not valid based on at least two validators were removed for the final analysis (results shown in Table 7-6).

Table 7-6. Validity of candidate of relative deprivation items

	All Age Groups			0-4			5-6			7-12			13-15			16-17		
	Expenditure	Assets	Income	Expenditure	Assets	Income	Expenditure	Assets	Income	Expenditure	Assets	Income	Expenditure	Assets	Income	Expenditure	Assets	Income
No mobile phone	✓	×	×	na	na	na	na	na	na	×	×	×	✓	✓	✓	✓	✓	✓
No internet access	✓	✓	✓	na	na	na	×	×	×	✓	✓	✓	✓	✓	✓	✓	✓	✓
No TV	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Paid Work	×	✓	×	na	na	na	×	×	×	×	×	×	×	×	×	na	na	na
Unpaid Work	×	✓	×	na	na	na	✓	×	✓	×	×	✓	×	×	✓	na	na	na
Do not go to school or finish primary education	✓	×	×	na	na	na	na	na	na	×	×	✓	✓	✓	✓	✓	✓	×
Eating less than three times per day	×	✓	✓	×	×	×	×	×	×	×	×	×	×	×	✓	na	na	na
Insufficient protein	✓	✓	×	✓	×	×	✓	×	×	✓	×	×	✓	×	×	na	na	na
Stunting	×	✓	✓	✓	×	×	na	na	na	na	na	na	na	na	na	na	na	na
Underweight	×	×	✓	×	×	×	na	na	na	na	na	na	na	na	na	na	na	na
Wasting	✓	✓	✓	×	×	✓	na	na	na	na	na	na	na	na	na	na	na	na
Feeling bad about health condition	×	✓	✓	×	×	×	×	✓	×	×	✓	×	×	✓	✓	na	na	na
Missed days because of poor health	×	✓	×	×	✓	✓	×	✓	×	×	✓	✓	×	✓	×	na	na	na
Spent days in bed because of poor health	×	✓	✓	×	✓	✓	×	×	×	×	✓	✓	×	×	×	na	na	na
Perceived deterioration in health	×	✓	✓	×	✓	✓	×	✓	×	×	✓	✓	×	×	×	na	na	na
Did not receive immunisation	×	×	✓	✓	✓	✓	na	na	na	na	na	na	na	na	na	na	na	na
Illness untreated	✓	✓	✓	×	✓	×	×	×	×	✓	✓	✓	×	×	×	na	na	na
Infrequent contact with parents	✓	✓	✓	✓	×	✓	×	×	✓	✓	×	✓	×	×	✓	na	na	na
Excluded from decision making	×	×	✓	na	na	na	na	na	na	na	na	na	✓	✓	×	✓	✓	×
Inadequate roofing	✓	×	✓	✓	×	✓	×	×	×	✓	×	×	✓	×	×	✓	×	✓
Inadequate flooring	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

	All Age Groups			0-4			5-6			7-12			13-15			16-17		
	Expenditure	Assets	Income	Expenditure	Assets	Income	Expenditure	Assets	Income	Expenditure	Assets	Income	Expenditure	Assets	Income	Expenditure	Assets	Income
Inadequate ventilation	✓	✓	✓	✓	✓	×	✓	✓	×	✓	✓	✓	✓	✓	×	✓	✓	×
Overcrowded house	✓	✓	×	✓	✓	×	✓	×	×	✓	✓	×	✓	✓	×	×	✓	×
Cook in same place for sleep	✓	✓	×	×	✓	×	×	×	×	✓	×	×	×	×	✓	×	×	×
House surrounded by waste	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×	✓	✓	×
House surrounded by trash	✓	✓	×	×	✓	×	×	✓	×	✓	✓	×	×	✓	×	✓	✓	×
House surrounded by stagnant water	×	✓	✓	×	✓	✓	×	✓	×	×	✓	×	×	×	✓	×	×	×
House without well-maintained yard	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×
Using surface water for drinking	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Water sources over 200 meters away	×	×	✓	×	×	✓	×	×	×	×	×	✓	×	×	×	×	×	×
Lacks access to improved sanitation	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
House without electricity	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×	✓	✓	×
Household does not use clean cooking fuel	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Household does not have transport vehicle	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Village inaccessible by public transport	✓	×	✓	✓	×	✓	✓	×	✓	✓	×	✓	✓	×	✓	✓	×	✓
Neighbourhood perceived as unsafe	×	✓	✓	×	×	✓	×	×	×	×	×	×	×	×	×	×	×	×

Note: ✓ means that the relationships between items to the corresponding validity criterion are significant at 0.05 and there are reverse relationships between the validity criterion and the deprivation items (i.e. children from high income households are less likely to be deprived compared to children from low income households).
× means that the items did not pass the tests. 'na' means that the items are not applicable to the corresponding age groups.

Table 7-6 shows that some items are not valid, based on expenditure, assets or income. Interestingly, validity is not necessarily consistent across age groups. Although there are items that are valid in all age groups, some of the valid items are consistent in some age groups. There are even some items, such as “neighbourhood perceived as unsafe”, that are considered to have serious validity issues in almost all of the age groups. A summary of the items that passed the reliability and validity tests is given in the next subsection.

7.1.1.3 Summary of Items that Passed Reliability Tests and Validity Tests

The previous subsection identified the items that failed and passed the preliminary internal consistency test (alpha and omega), the item response test (discrimination and difficulty), and the validity test (based on households’ expenditure, asset and income). The set of retained variables was then identified based on those tests. The list of variables which passed all tests for all age groups can be seen in Table 7-7. Items that did not pass the tests in the total sample (all children age 0-17) and in all age groups (0-4, 5-6, 7-12, 13-15 and 16-17), i.e., any items that did not pass the tests in all the columns in the table, were excluded from the table.

Table 7-7. Summary of the results of preliminary internal consistency test, item response (discrimination and difficulty) tests, and validity test

	Age Groups					
	All	0-4	5-6	7-12	13-15	16-17
No mobile phone	×	na	na	×	✓	✓
No internet access	✓	na	×	✓	✓	✓
No TV	✓	✓	✓	✓	✓	✓
Did not go to school or finish primary education	×	na	na	×	✓	✓
Did not receive immunisation	×	✓	na	na	na	na
Inadequate flooring	✓	✓	✓	✓	✓	✓
House surrounded by waste	✓	✓	✓	✓	✓	×
House surrounded by trash	✓	✓	✓	×	×	×
House without well-maintained yard	×	✓	×	✓	×	×
Using surface water for drinking	✓	✓	✓	✓	✓	✓
Lacks access to improved sanitation	✓	✓	✓	✓	✓	✓
House without electricity	✓	✓	✓	✓	✓	✓
Household does not use clean cooking fuel	✓	✓	✓	✓	✓	✓
Village inaccessible by public transport	×	×	✓	✓	✓	×
Household does not have transport vehicle	✓	✓	✓	✓	✓	✓

Note: ✓ means that the items passed all tests. × means that the items did not pass the tests. 'na' means that the items are not applicable to the corresponding age groups. Items that did not pass the tests in the total sample (all children) and for all age groups were excluded from the table.

Table 7-7 shows that most of the retained items are household-level variables. Further internal consistency (alpha and omega tests) were conducted to check the internal consistency of remaining items. The test results can be seen in Table 7-8.

Table 7-8. Second Internal Consistency Test (Items that Passed Preliminary Internal Consistency, Item Response and Validity Tests),

	Alpha if Deleted					
	All Age (0-17)	0-4	5-6	7-12	13-15	16-17
No mobile phone	×	na	na	×	0.752	0.725
No internet access	**0.726**	na	×	0.686	0.740	0.708
No TV	0.677	0.64	0.691	0.643	0.744	0.712
Did not go to school or finish primary education	×	na	na	×	0.763	0.742
Did not receive immunisation	×	**0.699**	na	na	na	na
Inadequate flooring	0.716	0.677	0.729	0.680	0.767	0.741
House surrounded by waste	0.724	0.687	**0.740**	0.689	**0.776**	×
House surrounded by trash	0.734	×	×	×	×	×
House without well-maintained yard	×	**0.72**	×	**0.726**	×	×
Using surface water for drinking	0.698	0.658	0.712	0.659	0.754	0.728
Lacks access to improved sanitation	0.687	0.639	0.702	0.643	0.748	0.727
House without electricity	0.707	0.671	0.713	0.672	0.762	0.736
Household does not use clean cooking fuel	0.672	0.638	0.679	0.626	0.735	0.713
Household does not have transport vehicle	0.693	0.645	0.707	0.651	0.753	0.720
Village inaccessible by public transport	×	×	**0.752**	**0.703**	**0.779**	×
Total Alpha (All Items)	0.709	0.692	0.739	0.693	0.773	0.746
	Omega if Deleted					
	All Age	0-4	5-6	7-12	13-15	16-17
No mobile phone	×	na	na	×	0.762	0.736
No internet access	×	na	×	0.718	0.753	0.722
No TV	0.685	0.672	0.703	0.669	0.747	0.718
Did not go to school or finish primary education	×	na	na	×	0.772	0.755
Did not receive immunisation	×	**0.730**	na	na	na	na
Inadequate flooring	0.728	0.710	0.747	0.709	0.775	0.751
House surrounded by waste	0.738	0.726	**0.758**	0.722	**0.786**	×
House surrounded by trash	0.746	×	×	×	×	×
House without well-maintained yard	×	**0.738**	×	0.737	×	×
Using surface water for drinking	0.714	0.697	0.735	0.695	0.764	0.741
Lacks access to improved sanitation	0.703	0.686	0.724	0.683	0.758	0.736
House without electricity	0.710	0.696	0.720	0.693	0.763	0.738
Household does not use clean cooking fuel	0.691	0.679	0.707	0.667	0.746	0.726
Household does not have transport vehicle	0.707	0.690	0.726	0.688	0.762	0.731
Village inaccessible by public transport	×	×	**0.765**	**0.729**	**0.785**	×
Total Omega (All Items)	0.730	0.711	0.755	0.721	0.780	0.756

Note: The alpha and omega scores of Items that would improve internal consistency if deleted are highlighted in bold. × means that the items did not pass the tests. 'na' means that the items are not applicable to the corresponding age groups.

The internal consistency of the items that passed the reliability and validity tests is higher than the internal consistency of the items in the preliminary list. In most of the age groups, the alpha score is more than 0.7, except for age groups 0-4 and 7-12. On the other hand, all of the omega scores are more than 0.7. However, some items are unreliable and would increase omega and alpha when deleted. Table 7-9 shows the alpha and omega scores after those unreliable items were deleted.

Table 7-9. List of valid and reliable indicators based on age groups

	Age Groups					
	All Age (0-17)	0-4	5-6	7-12	13-15	16-17
No mobile phone	×	na	na	na	✓	✓
No internet access	×	na	na	✓	✓	✓
No TV	✓	✓	✓	✓	✓	✓
Did not go to school or finish primary education	×	na	na	×	✓	✓
Inadequate flooring	✓	✓	✓	✓	✓	✓
Using surface water for drinking	✓	✓	✓	✓	✓	✓
Lacks access to improved sanitation	✓	✓	✓	✓	✓	✓
House without electricity	✓	✓	✓	✓	✓	✓
Household does not use clean cooking fuel	✓	✓	✓	✓	✓	✓
Household does not have transport vehicle	✓	✓	✓	✓	✓	✓
Alpha	0.745	0.736	0.760	0.746	0.785	0.746
Omega	0.759	0.747	0.775	0.758	0.793	0.756

Note: ✓ means that the items passed all reliability tests and also validity tests. × means that the items did not pass the tests. 'na' means that the items are not applicable to the corresponding age groups. Items that did not pass the tests for the total sample (all children) and for all age groups were excluded from the table.

As can be seen from Table 7-9, removal of these items increases internal consistency further. In this case, alpha and omega scores for all of the age groups prove higher than 0.7. In general, age-specific estimates also show higher internal consistency (except for 0-4) compared to estimates from total children.

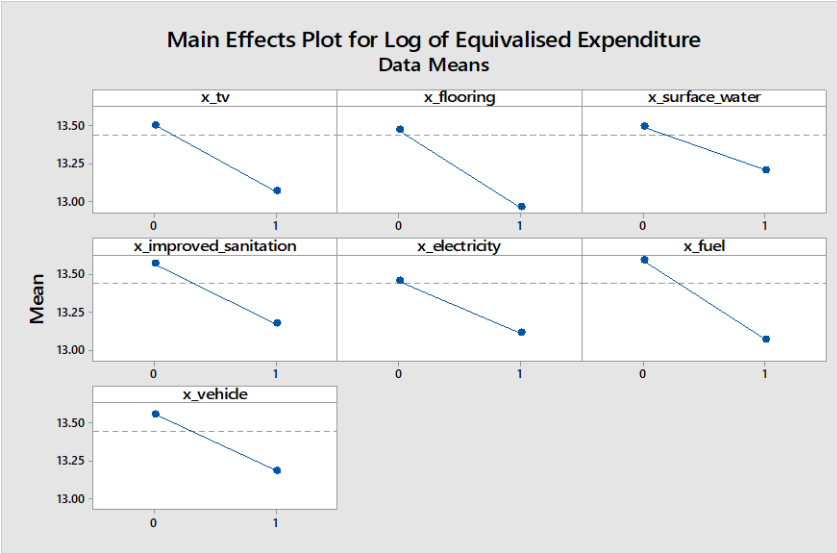
7.1.1.4 Additivity and Final Selection of Retained Items

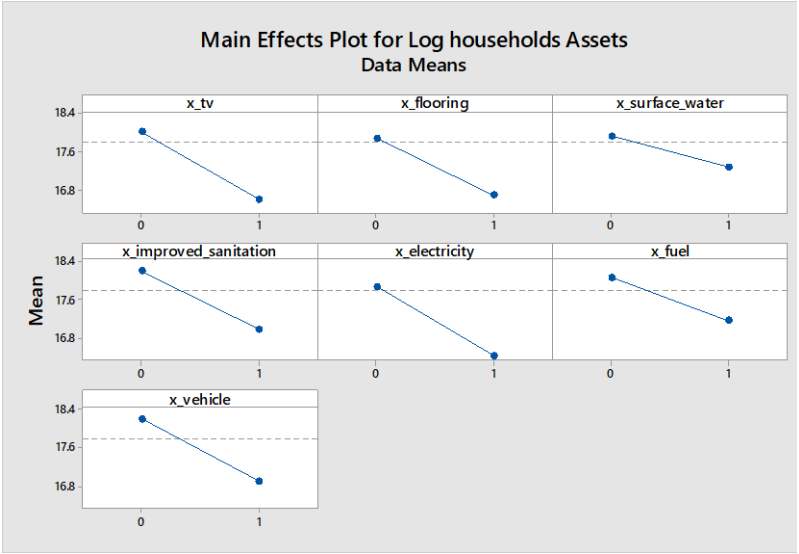
The additivity test aimed to assess whether the selected indicators were additive. Namely, it tested whether the items indicated increased poverty for children who were deprived of more items than for children deprived in fewer items.

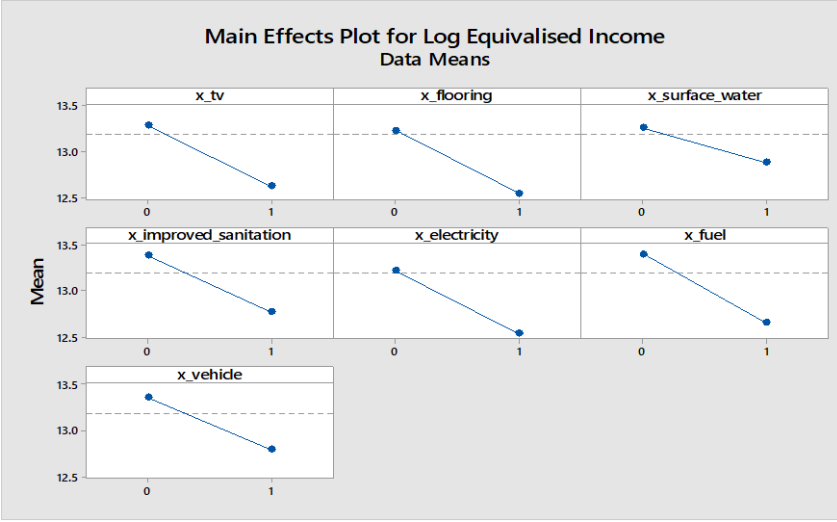
There are several possible approaches to test additivity. The first is using the main effect plot income for each item (Fahmy et al., 2007; Guio et al., 2017; 2016). This approach would assume that the children who are experiencing deprivation in any specific item will have a lower average monetary resource compared to children who are not deprived (See *Figure 7-1*). The second approach is to use second-order interaction of deprivation items by monetary resources (See *Figure 7-2*), which is mainly a graphical method (Fahmy et al., 2007; Gordon and Nandy, 2012; Guio et al., 2017; 2016). The third approach involves using confidence interval graphs (Gordon and Nandy, 2012) (See *Figure 7-4*). To apply the additivity tests in this chapter, the author applied all those approaches using three means of monetary resources, namely equivalised expenditure, household's assets, and equivalised income, to provide more robust estimates.

Additivity was only considered as a serious problem for a specific variable when both main effect plots and second-order interaction plots were problematic. This chapter considers that the interaction of an item is problematic if the issues happen in the majority of the interactions of that item (i.e. a problem in 4 of 6 interactions), and a similar problem also arises when testing the second-order interaction with different means.

Figure 7-1. Main effect of relative deprivation indicators on equivalised expenditures, household assets, and equivalised income (age 0-17)

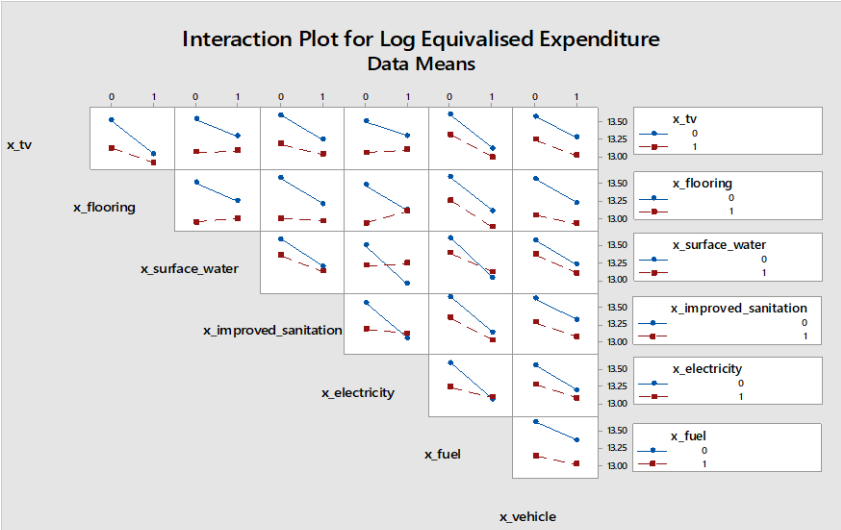


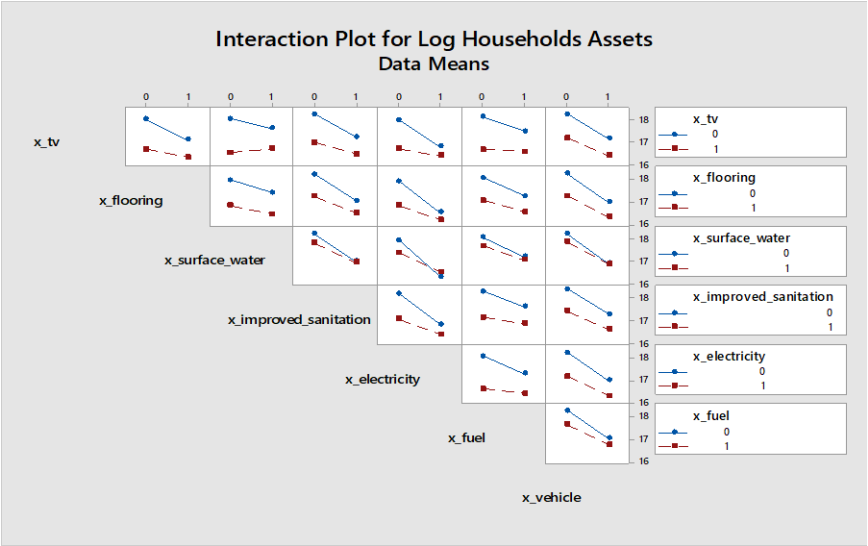


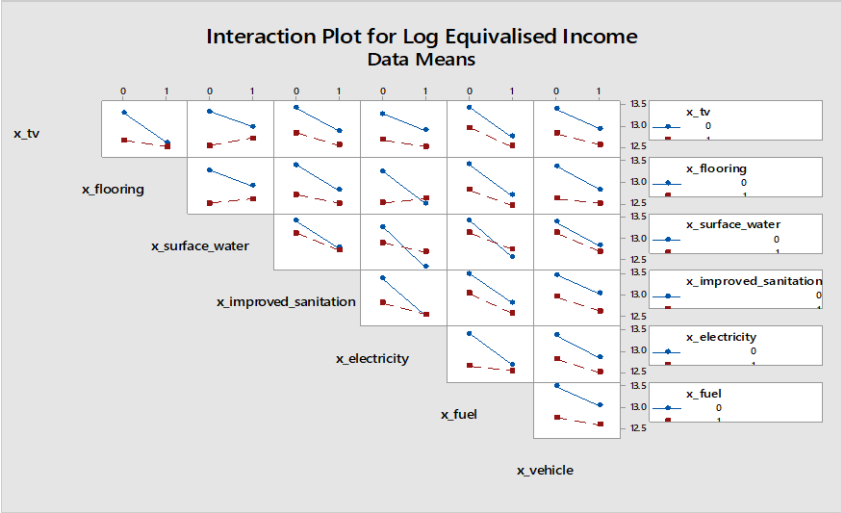


Note:
x_tv = No TV,
x_flooring = Inadequate flooring,
x_human_waste = House surrounded by human and animal waste,
x_surface_water = Using surface water for drinking,
x_improved_sanitation = House lacks access to improved sanitation,
x_electricity = House without electricity,
x_fuel = Household does not use clean cooking fuel,
x_vehicle = Household does not have transport vehicle

Figure 7-2. Second-order interaction plot of relative deprivation indicators on log equivalised expenditures, log household assets, and log equivalised income (age 0-17)







Note:
x_tv = No TV,
x_flooring = Inadequate flooring,
x_human_waste = House surrounded by human and animal waste,
x_surface_water = Using surface water for drinking,
x_improved_sanitation = Lacks access to improved sanitation,
x_electricity = House without electricity,
x_fuel = Household does not use clean cooking fuel,
x_vehicle: Household does not have transport vehicle

The main effect plot of log equivalised expenditure, household assets, and equivalised income for age 0-17 can be seen in *Figure 7-1*. The main effect plot shows that there were no problems. Children who are deprived have lower equivalised expenditure, lower assets, and lower equivalised income.

Second-order interaction shows that there are some issues of interaction among items. Using the example of age 0-17 with log equivalised expenditure and income as means of monetary resources (*Figure 7-2*), it can be seen that “House without electricity” has issues with the majority of interactions such as with “Inadequate flooring” and “Using surface water for drinking”. However, further investigation in the dataset showed that only 562 children are deprived in both electricity and surface water, and only 299 children are deprived in both electricity and flooring. Considering that those numbers (562 and 299) are small compared with the sample size (21,396), the estimates from interaction seem to have low statistical power. Therefore, the interaction of “house without electricity” with other items should not become a major issue. Furthermore, removing “house without electricity” would reduce the internal consistency of the measure (alpha and omega scores would drop).

Based on the considerations according to the main effect plot and second-order interaction plot, this chapter argues that there are no major additive issues in the items. No items were excluded on this basis. The final list of included indicators for the relative deprivation index is shown in Table 7-10.

Table 7-10. Final list of relative deprivation indicators based on age groups

	Age Groups					
	All Age (0-17)	0-4	5-6	7-12	13-15	16-17
No mobile phone					✓	✓
No internet access				✓	✓	✓
No TV	✓	✓	✓	✓	✓	✓
Did not go to school or finish primary education					✓	✓
Inadequate flooring	✓	✓	✓	✓	✓	✓
Using surface water for drinking	✓	✓	✓	✓	✓	✓
Lacks access to improved sanitation	✓	✓	✓	✓	✓	✓
House without electricity	✓	✓	✓	✓	✓	✓
Household does not use clean cooking fuel	✓	✓	✓	✓	✓	✓
Household does not have transport vehicle	✓	✓	✓	✓	✓	✓

As shown in Table 7-10, the indicators included in the total sample (0-17), age 0-4, and age 5-6 indices are the same. The 7-12 and 13-17 age indices cover these and additional age-specific indicators.

Once indicators were selected, the next step in the strategy was to identify the threshold to distinguish children who experience relative deprivation. The results of this step can be seen in the next subsection.

7.1.2 **Calculating Relative Deprivation Indices and Setting the Poverty Threshold**

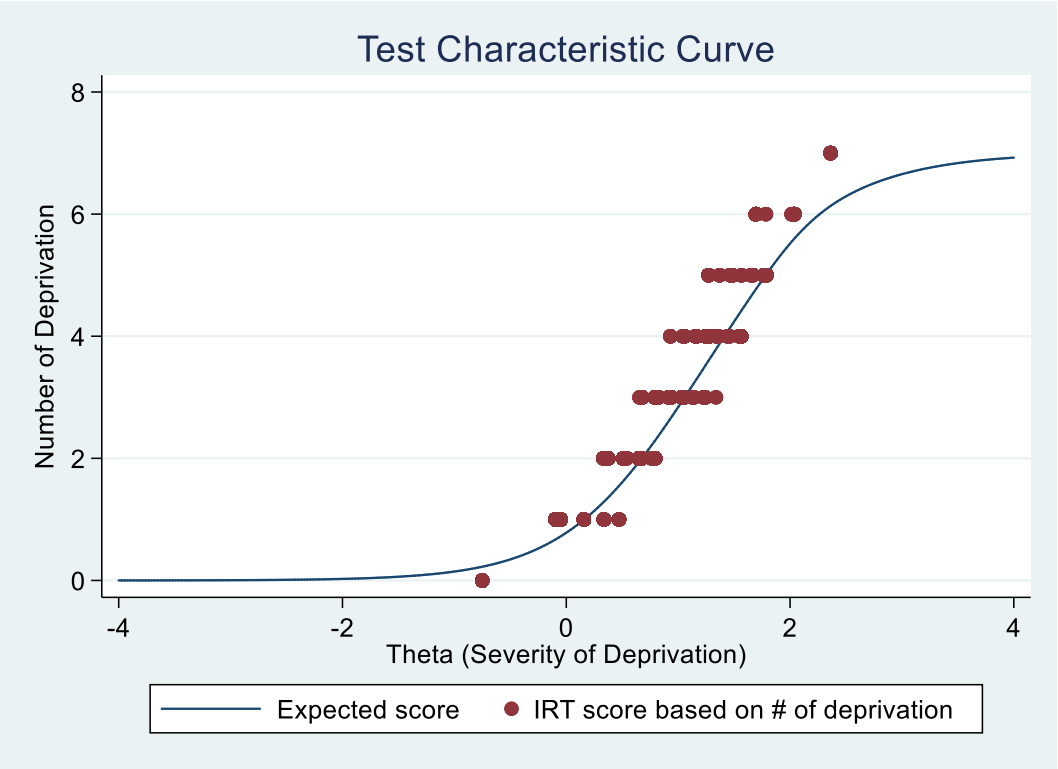
7.1.2.1 Calculating Relative Deprivation Indices

The relative deprivation index was calculated using two approaches: raw sum score and item response theory (IRT). The composite indicator was computed using the raw sum score by adding up the weighted deprivation items of each domain-level indicator. The maximum score is the total number of the items; the minimum score is 0 when children are not experiencing deprivation in any items. On the other hand, the deprivation index based on IRT was estimated using a two-parameter logistic model (2PL).

The IRT factor scores were estimated by predicting the latent trait of deprivation of children. The prediction of a latent trait involves assigning individual values to each item in the model based on 2PL estimates using STATA version 15. By default, STATA used empirical Bayes means to combine prior information of the latent trait to predict posterior distribution of the latent trait (Raykov and Marcoulides, 2017; Rosier, 2015). Children who are deprived in the same combination of items would get the same level of factor scores (Raykov and Marcoulides, 2017).

There is strong association between the raw sum score (RSS) and the factor score based on item response theory (IRT). The correlation between these scores is almost perfect (0.979). Furthermore, the association can also be observed further in the following graph (*Figure 7-3*), which combines the IRT test characteristics curve with a scatterplot of relative deprivation indices.

Figure 7-3. Test characteristics curve and scatterplot of the indices



The TCC in *Figure 7-3* shows the relationship between the severity of deprivation by IRT 2PL and the number of deprivations experienced by children. The curve informs the number of deprivations corresponding to specified locations of severity. The scatterplot (red plots) illustrate the level of IRT factor scores that constitute each level of the raw sum score. According to *Figure 7-3*, when children experience more deprivations, their IRT factor scores are also more likely to be higher than those of children who experience low deprivation.

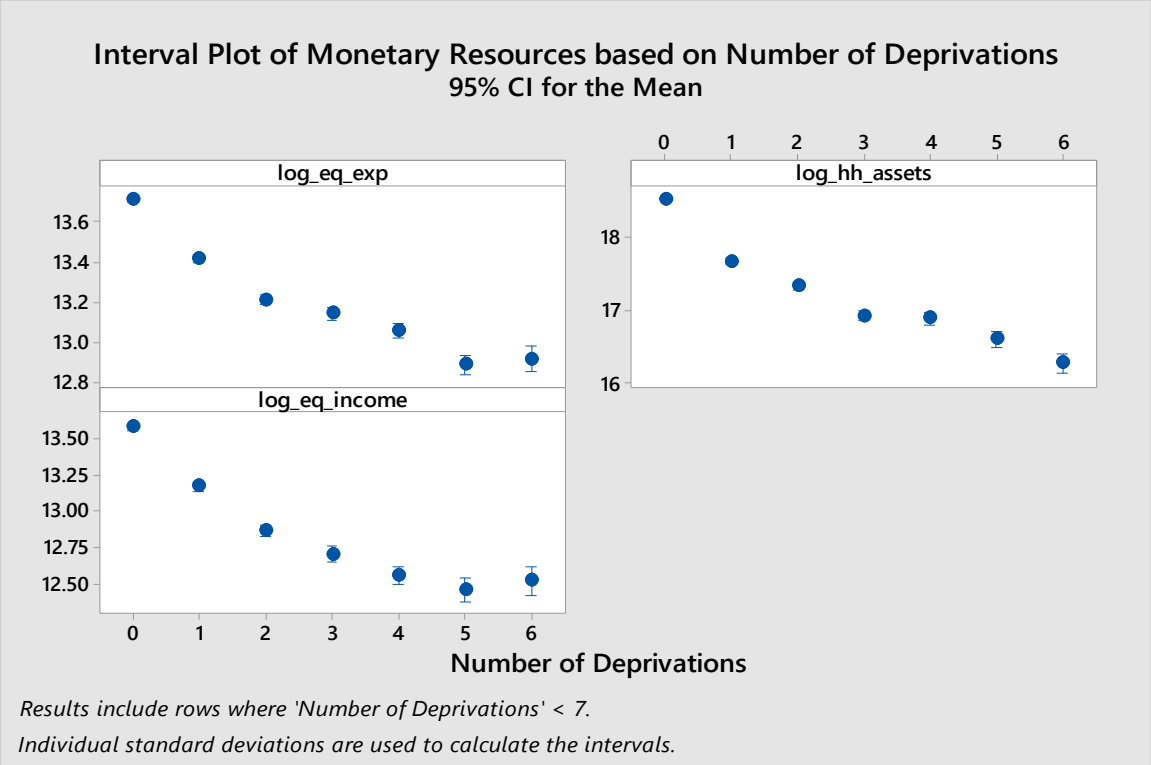
7.1.2.2 Threshold Setting

A threshold was needed to distinguish children experiencing relative deprivation. There are many possible approaches to identify thresholds. These approaches include the graphical approach of different levels of deprivation using a CI graph (Fahmy et al., 2007; Gordon and Nandy, 2012; Guio et al., 2016), logistic regression (Fahmy et al., 2007; Gordon and Nandy, 2012; Guio et al., 2016), ANOVA (Fahmy et al., 2007; Gordon and Nandy, 2012; Guio et al., 2016), outlier-based identification (Pérez–Mayo, 2006), and Poisson distribution (Babones et al., 2015). While the

outlier approach and Poisson distribution rely on the distribution of the children who are deprived based on different levels of deprivation, the graphical approach, ANOVA, and logistic regression use the resources (expenditure) as the basis to identify the thresholds. The use of resources (expenditure) as the basis to identify the thresholds is consistent with the definition of deprivation by Townsend (1979; 1993), who argues that deprivation is the consequence of lacking resources. Thus, the identification of the thresholds of relative deprivation cannot rely exclusively on the distribution of children who are deprived; the threshold identification also needs to acknowledge the resources. Therefore, this chapter followed the combination confidence interval (CI) graph and also ANOVA and logistic regression to identify the thresholds. This approach was considered more appropriate for theoretical reasons.

When comparing the average of expenditure based on the numbers in the confidence interval (CI) graph for children age 0-17 (*Figure 7-4*), it can be seen that the average of expenditure is lower when the numbers of deprivation increase. This indicates that when children experience more deprivation, they experience the worst situation of deprivation possible (which indicates that the set of items are additive).

Figure 7-4. Log equivalised expenditures, log household assets, and log equivalised income of each level of relative deprivation (age 0-17)



Note: log_eq_exp = Log equivalised expenditure, log_hh_assets = Log household assets, log_eq_income = Log equivalised income. The estimates in the plots excluded children who are deprived in 7 indicators or more.

The comparison graph (*Figure 7-4*) shows a sharp change of log equivalised expenditure and income between deprivation in one indicator and deprivation in two indicators. This sharp change suggests that deprivation in two indicators or more is a more appropriate threshold. However, the log of household assets provides a different indication of deprivation in one indicator as the threshold.

The logistic regression and ANOVA analysis were carried out to provide supporting evidence. For the logistic regression, the dependent variable is the binary variable that distinguishes deprivation of a certain level (i.e. one indicator or more) and non-deprivation. The independent variables are a log of equivalised expenditure, the number of adults, and the number of children in the households. The LR chi2 estimates for each age group were compared. The highest LR chi2 estimate indicated the threshold.

In ANOVA, the dependent variables are a log of equivalised expenditure, while the independent variables are binaries of different levels or deprivations and also the number of adults in the households and the number of children in the households. The ‘F’ estimates for ANOVA models of different level age groups were compared; the model with the highest ‘F’ indicates the appropriate thresholds. The estimates based on logistic regression and ANOVA can be consulted in Table 7-11.

Table 7-11. Logistic regression and ANOVA to identify the position of threshold of relative deprivation

	All		0-4		5-6		7-12		13-15		16-17	
	LR Chi 2	ANOVA (F)	LR Chi	ANOVA (F)	LR Chi 2	ANOVA (F)	LR Chi 2	ANOVA (F)	LR Chi 2	ANOVA (F)	LR Chi 2	ANOVA (F)
Base model*	-	141.45	-	57.60	-	28.38	-	50.26	-	21.89	-	12.45
Deprived in at least one indicator	3372.89	250.05	1071.14	**98.50**	399.70	43.18	635.19	71.35	405.83	35.87	267.17	**26.17**
Deprived in at least two indicators	**4216.41**	**258.04**	**1240.20**	98.02	**559.00**	**46.45**	1314.30	**94.21**	**538.79**	**39.22**	**279.65**	24.46
Deprived in at least three indicators	3819.72	226.36	1168.53	88.88	457.77	41.37	**1487.11**	92.53	615.22	38.82	232.72	21.50
Deprived in at least four indicators	2966.07	198.66	981.38	79.74	387.72	37.85	1402.17	83.39	611.23	37.75	215.83	19.30
Deprived in at least five indicators	1956.26	175.55	664.92	70.53	291.24	33.75	1001.37	70.13	518.66	34.34	161.85	17.36

Logistics regression and ANOVA show that, in general, deprivation in two items or more is the appropriate threshold since estimation of the total number of children and for most of the age groups have the highest level of LR chi2 and ‘F’ at that point. Therefore, deprivation of two items or more was selected for the thresholds.

Since the IRT factor score is not a number of indicators but an index of continuous variables, the thresholds of the IRT’s factor score were estimated based on the average factor score of children who are deprived in two indicators.

7.2. Relative Deprivation among Children in Indonesia

This section provides an overview of the empirical findings using the selected indicators and threshold. The reliability and validity tests informed that the items are not necessarily more reliable and valid when tested based on age-specific groups. The thresholds were also similar across age groups (in general, deprived in at least two items is the appropriate threshold). Accordingly, the focus of the empirical analysis is mainly on the general population of children age 0-17 with limited attention paid to age-specific analysis.

7.2.1. Overview of Relative Deprivation

As an introduction, the proportions of children who are estimated to experience relative deprivation are shown in Table 7-12. In total, these estimates suggest that between 25% and 32% of all children in Indonesia experience relative deprivation, with the rate highest in the 7-12 age group (27–34%). Although differences based on age groups are small, the ANOVA test confirmed the differences according subgroups. In all age groups, relative deprivation headcounts based on raw sum score (RSS) are higher compared to the headcounts based on item response theory (IRT).

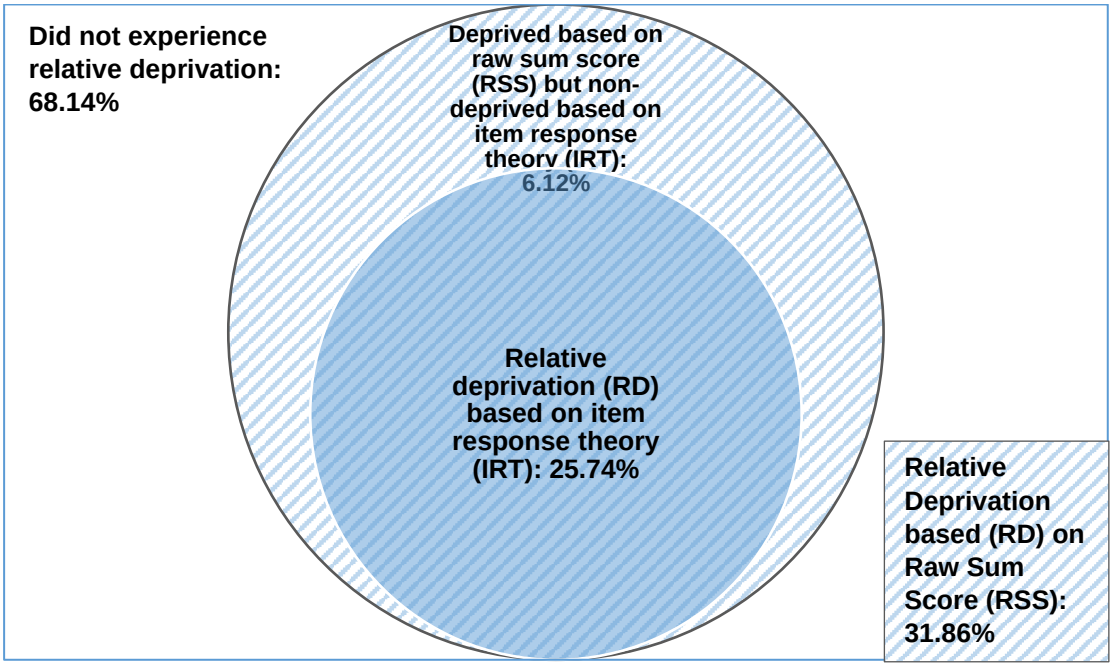
Table 7-12. Relative deprivation of children by age groups

	Proportion of Children Who Experience Relative Deprivation	
	Deprived based on raw sum score (RSS) (%)	Deprived based on item response theory (IRT) (%)
All Children age 0-17 (Total)	**31.86**	**25.74**
Age 0-4	30.74***	24.47**
Age 5-6	31.35***	25.26**
Age 7-12	33.61***	27.34**
Age 13-15	30.71***	24.61**
Age 16-17	31.46***	26.63**

Note:*** is significant at 0.01, ** is significant at 0.05.

The consistencies of relative deprivation based on RSS and IRT were observed based on overlaps and discrepancies using Venn diagram. The diagram can be seen in *Figure 7-5*.

Figure 7-5. Venn diagram of relative deprivation based on raw sum scores and item response factor scores



Deprivation based on an item's IRT estimate is a subset of deprivation based on RSS. Thus all children who experience relative deprivation based on IRT also experience relative deprivation based on RSS. This indicates that the differences between deprivation based on RSS and IRT are dependent on the level of poverty thresholds.

7.2.2. Disparities of Relative Deprivation among Children

To investigate the disparity among sub-groups, Table 7-13 shows the proportions of children experiencing relative deprivation in terms of individual characteristics, household characteristics, and regions. The differences within each subgroup were tested using ANOVA, and differences which reached significance are indicated.

Table 7-13. Proportion of children who experience relative deprivation based on raw sum score and item response theory by individual, household, and geographic characteristics subgroups

		Proportion of Children Who Experience Relative Deprivation	
		Deprivation based on raw sum score (RSS) (%)	Deprivation based on item response theory (IRT) (%)
Sex of the children	Male	31.20	25.24
	Female	32.56	26.28
Education level of household head	No schooling or primary dropout	66.31***	59.08***
	Primary school	46.31***	37.93***
	Junior high school	30.18***	23.54***
	Senior high schools	16.80***	12.70***
	University	6.31***	4.37***
Sex of household head	Male	31.63**	25.76
	Female	33.42**	25.62
Religious affiliation of household head	Other religions	61.30***	57.79***
	Islam	26.44***	19.85***
Occupations of household head	Not working or doing unpaid work	31.28	23.83**
	Doing paid work	31.97	26.13**
Value of household assets (quintile range in Indonesian million Rp.)	Lowest (0–12.8 M)	51.04***	42.64***
	Lower (12.8–40.8 M)	46.39***	38.06***
	Medium (40.8–96.5 M)	32.81***	24.92***
	Higher (96.5–222 M)	18.55***	15.42***
	Highest (>222 M)	9.63***	7.09***
Areas	Urban	13.20***	7.85***
	Rural	50.44***	43.57***
Islands	Java	21.66***	15.50***
	Outside of Java	44.43***	38.37***
Total		31.86	25.74

Note:*** is significant at 0.01, ** is significant at 0.05.

Male and female children show similar levels of deprivation. However, the comparison of relative deprivations based on education of heads of household provides very clear results. Table 7-13 shows that in terms of experiencing relative deprivation, there are lower proportions of children from households with an educated head, for example, university-level educated heads (RSS: 6%, IRT: 4%), compared to children from households with heads who never attended formal education (RSS: 66%, IRT 59%). Children who are from female-headed households are slightly more deprived compared to children from male-headed households. Children from households whose heads are Muslim are less deprived (RSS: 26%, IRT: 19%) compared to children from households whose heads are non-Muslim (RSS: 61%, IRT: 57%). Unexpectedly, although the differences are very small, IRT estimates shows children with heads of households who have paid employment are slightly more deprived compared to children with unemployed and unpaid heads of households.

Children from households with more assets are less deprived compared to children from households less assets. For example, the proportion of children who are deprived in the lowest quintile of assets is five times (RSS: 43%, IRT: 51%) the proportion of children deprived in the highest quintile (RSS 10%, IRT: 7%)

Disparities between regions also exist. Deprivation in rural areas (RSS: 50%, IRT: 44%) is higher than in urban areas, and deprivation is higher outside Java (RSS: 44, IRT: 38%) compared to in Java (RSS: 22%, IRT: 15%).

More detail subgroup comparison between RSS and IRT can be consulted in Appendix H (Table H-3). Table H-3 informs subgroup comparison of relative deprivation rates in terms of individual characteristics, household characteristics, and regions based on age groups of children.

As well as thresholds, it is useful to consider the average number of deprivations and the intensity of relative deprivation because these measurements express the severity of deprivation experienced by the children. (See subsection 6.2.3 in the previous chapter for a more detailed discussion on this concept). These data are shown in Table 7-14.

Table 7-14. Average level and intensity of relative deprivation by individual, household, and geographic characteristics subgroups (age 0-17)

		Average number of Deprivation Indicators	Intensity of Deprivation (0-100 Scale)	Adjusted Headcount Ratio based on Raw Sum Score (%)	Adjusted Headcount Ratio based on Item Response Theory (%)
Sex of the children	Male	2.26	40.99	12.79	10.34
	Female	2.33	41.53	13.52	10.91
Education level of household head	No schooling or primary dropout	3.22***	48.01***	31.83***	28.36***
	Primary school	2.47***	40.71***	18.85***	15.44***
	Junior high school	2.12***	40.93***	12.35***	9.63***
	Senior high schools	1.87***	40.19***	6.75***	5.11***
	University	1.55***	37.85***	2.39***	1.66***
Sex of household head	Male	2.29	41.32	13.07	10.64
	Female	2.35	40.87	13.66	10.47
Religious affiliation of household head	Other religions	3.60***	54.44***	33.37***	31.46***
	Islam	1.93***	35.64***	9.42***	7.07***
Occupations of household head	Not working or doing unpaid work	2.19	38.89***	12.16	9.27***
	Doing paid work	2.32	41.73***	13.34	10.90***
Value of household assets (quintile range in Indonesian million Rp.)	Lowest (0–12.8 M)	2.66***	45.42***	23.18***	19.37***
	Lower (12.8–40.8 M)	2.56***	42.20***	19.58***	16.06***
	Medium (40.8–96.5 M)	2.10***	37.99***	12.47***	9.47***
	Higher (96.5–222 M)	1.81***	36.34***	6.74***	5.60***
	Highest (>222 M)	1.74***	36.34***	3.50***	2.58***
Areas	Urban	1.49***	30.34***	4.01***	2.38***

		Average number of Deprivation Indicators	Intensity of Deprivation (0-100 Scale)	Adjusted Headcount Ratio based on Raw Sum Score (%)	Adjusted Headcount Ratio based on Item Response Theory (%)
Islands	Rural	2.71***	44.10***	22.25***	19.21***
	Java	1.77***	33.42***	7.24***	5.18***
	Outside of Java	2.76***	45.97***	20.43***	17.64***
Total		2.29	41.26	13.14	10.62

Note: *** is significant at 0.01, ** is significant at 0.05

When observing the level and intensity of deprivation of all children, disparities based on individual characteristics are small. For example, there is a small disparity between male and female children in the context of the level and intensity of deprivation. Table 7-14 shows that there are similar numbers of items (i.e. 2.26 male and 2.33. female) and no significant differences in the intensity of deprivations experienced by male and female children. This finding is consistent with the result of comparison among the proportion of deprived children in Table 7-13.

Disparities based on the characteristics of the heads of the households do exist. Table 7-14 shows that children of households with educated heads experience less intense deprivation (i.e. the number of indicators of children with university-educated heads is 1.55) compared to children of uneducated heads of households (i.e. the number of indicators of children with heads who have no schooling or who dropped out in primary school is 3.22).

There also seems to be disparity in the level and intensity of deprivation based on the religion of heads of households. Table 7-14 shows that children from households with non-Muslim heads experience higher numbers and greater intensity of deprivation compared to those with from households with Muslim heads.

Supporting the previous findings in Table 7-14 shows that children from households with an unemployed head face less deprivation and lower intensity of deprivation and also a lower proportion of adjusted headcount ratio compared with children whose household heads are employed, albeit the differences are small.

Differences in level of assets also contribute to the level and intensity of deprivation. As shown in Table 7-14, households with higher assets experience less deprivation and have a lower level of intensity of deprivation and also a lower adjusted headcount ratio when compared to households with lower assets.

Differences in the location of living also contribute to disparity in the level and intensity of deprivation. As illustrated in Table 7-14, children living in rural areas experience more deprivation and a higher level of intensity of deprivation compared to children living in urban areas. Additionally, children living in Java

experience deprivation in fewer items, lower intensity of deprivation, and a lower adjusted headcount ratio compared to children who are living outside Java.

7.2.3. Checking for Sensitivity and Robustness of Absolute Deprivation Thresholds

Similar to CHAPTER 5 and CHAPTER 6, the primary strategy of the robustness test is to confirm the subgroup comparison using the odds ratio based on logistic regression. However, as a supplement, this chapter compares the sensitivity of thresholds according to the raw sum score (RSS) and item response theory (IRT) in *Figure 7-6*. The sensitivity was indicated by the level of change in the proportion of children experiencing relative deprivation (y-axis) by indicating the number of deprivation indicators as the threshold (x-axis).

Figure 7-6. Sensitivity of relative deprivation thresholds

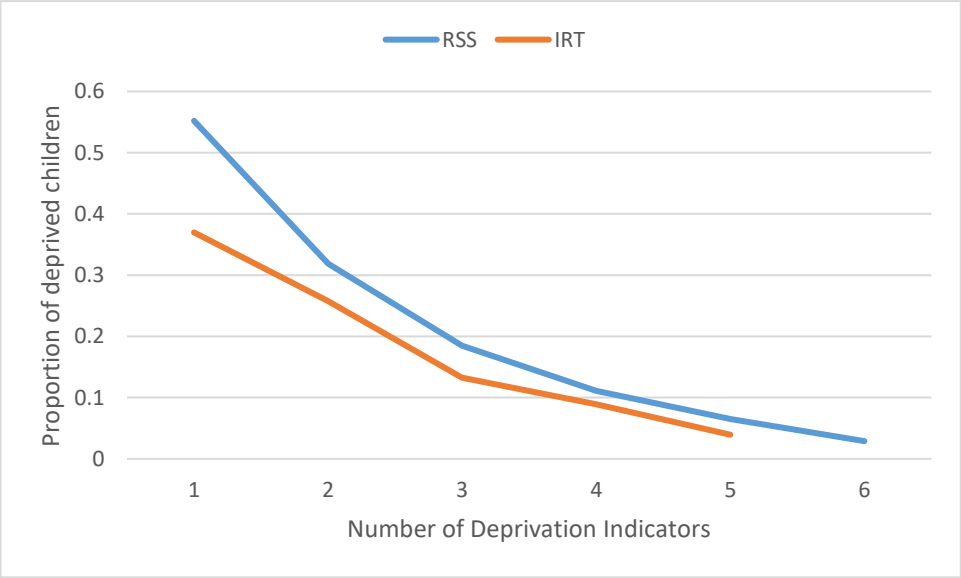


Figure 7-6 confirms that RD poverty thresholds operate differently for RSS compared to IRT. With a threshold of one deprivation indicator, 55% of children suffer relative deprivation according to RSS, and only 33% according to IRT. Using a threshold of two deprivations, the differences narrow with 32% of children deprived according to RSS compared to 26% of children deprived according to IRT. As confirmation, Table 7-15 shows the odd ratio of factor associated with relative deprivation according to both RSS and IRT.

Table 7-15. Odds ratio of factor associated with relative deprivation

	(1) Deprived based on Raw Sum Score (RSS)	(2) Deprived based on Item Response Theory (IRT)
Living in urban areas	0.238***	0.178***
	(0.0121)	(0.0106)
Living in Java	0.518***	0.497***
	(0.0257)	(0.0273)
Primary school	0.488***	0.473***
	(0.0599)	(0.0576)
Junior high school	0.211***	0.198***
	(0.0270)	(0.0254)
Senior high schools	0.122***	0.115***
	(0.0156)	(0.0146)
University	0.0652***	0.0578***
	(0.00968)	(0.00899)
Female head of household	1.014	0.947
	(0.0792)	(0.0796)
Muslim head of household	0.289***	0.224***
	(0.0172)	(0.0141)
Employed	1.112	1.178**
	(0.0757)	(0.0896)
Lower	0.719***	0.661***
	(0.0472)	(0.0463)
Medium	0.353***	0.326***
	(0.0241)	(0.0237)
Higher	0.209***	0.242***
	(0.0158)	(0.0201)
Highest	0.143***	0.145***
	(0.0132)	(0.0147)
Constant	26.14***	23.06***
	(4.022)	(3.620)
Observations	21,307	21,307

Note: *** is significant at 0.01, ** is significant at 0.05, * is significant at 0.1
(Standard errors of statistics in parentheses).

Using the odds ratio, Table 7-15 shows that children who are deprived according to both RSS and IRT approaches have similar characteristics. These data confirm the estimates of Table 7-13 and Table 7-14, which show that children who are living in urban areas are significantly less likely to experience relative deprivation. However, children who are living in Java slightly have higher chance to deprived according based RSS estimate while slightly have less chance to deprived based on IRT estimate. In this context, the odd ratio estimate of IRT are more consistent to odd ratio of monetary and absolute deprivation in other chapters (CHAPTER 5 and CHAPTER 6) than RSS. Controlling with other variables. the odd ratio estimates in other chapters inform that children who are living in Java has lower chance to experience child poverty.

Since the differences are small after controlling with other variables, the odds of being identified as living in poverty are not always significantly different for children whether their household head has paid work or not.

Consistent with theory, children from households that have more assets are less likely to suffer relative deprivation, as are children living in a household with a Muslim head.

7.3. Conclusion

This chapter investigated relative deprivation among children in Indonesia. Candidate indicators were identified according to the findings of qualitative studies to capture the views on the domains of child poverty and the matching of corresponding indicators in the dataset. Indicators were selected considering reliability (internal consistency, discrimination, and difficulty tests), validity, and additivity.

This chapter estimated relative deprivation indices based on raw sum score (RSS) and item response theory (IRT). The indices were generated based on the total sample of all observed children because the reliability and validity tests were not able to show the benefit of using age-specific indicators.

The empirical analysis showed that between 31.86 and 25.74% of children experienced relative deprivation according to both RSS and IRT respectively. The

deprivation estimate based on the RSS was higher than based on IRT. The robustness checks informed that subgroup comparison of deprivation based on IRT was consistent to monetary and absolute deprivation.

Based on theoretical reasons, this chapter selects the relative deprivation based on IRT for further analysis in the next chapter. Unlike the relative deprivation score based on RSS, the relative deprivation score based on IRT does not treat each item equally, but rather acknowledges the level of severity and discrimination of each deprivation item.

CHAPTER 8. COMPARISON OF CHILD POVERTY MEASURES

Chapter Summary

This chapter reports a comparison and evaluation of the child poverty estimates derived in this thesis.

- This chapter presents the analysis strategy (section 8.1) and an empirical comparison of child poverty measures in Indonesia (section 8.2.2).
- The accuracy of the measures is explored.
  - Latent class analysis is used to develop a reference standard for the analysis of the sensitivity, specificity, and predictive values.
  - Receiver operating characteristics (ROC) curves are used to investigate the area under curve.
- The data show that the proportions of poor based on relative deprivation are higher than the proportions of poor based on absolute deprivation or monetary measures (25.7, 17.3, and 10.4% of all children respectively).
- The groups of children with the highest poverty rates were similar across measures. Those children were more likely to come from households in which the heads had less education or were non-Muslim, to come from households with the lowest assets, and to be living outside Java and in rural areas.
- Only a small proportion of children were poor by all child poverty measures (3.9% of all children). The main reason for this small proportion is the weak relationships between the monetary measures and absolute deprivation.
- Considering sensitivity, specificity, predictive values, and the results of ROC curves, each measure performed differently.
  - The monetary measure was least accurate compared to absolute and relative deprivation. Despite having the highest specificity (95.85%), the monetary measure had lower sensitivity and predictive values and also the smallest area under the curve.
  - Absolute deprivation showed a balance of high sensitivity (84.92%), high specificity (95.37%), and high negative predictive value (96.91%). It also had the highest positive predictive value (78.71%). The estimates of area under the curve based on ROC analysis showed that absolute deprivation is more prevalent in rural areas.
  - Relative deprivation had the highest level of sensitivity (100%) and the highest negative predictive value (100%), but it had the lowest specificity and the lowest positive predictive value. The results of the ROC analysis showed that ROC analysis is more fit for analysis of child poverty in urban areas and in Java.

8.1 Measurement and Analysis Strategy

Theoretically, different child poverty measures provide different profiles of child poverty. For example, because of differences between the indirect concept of poverty focusing on resources and the direct concept of poverty focusing on outcomes, the multidimensional approach cannot serve as a proxy for the monetary approach, and vice versa. Resources only provide half the picture of child poverty. Measuring child poverty from monetary perspectives as an indication of the measurement of resources does not provide adequate information about the nature of poor children in the context of deprivation. However, non-monetary measurements exclude resources as one of the key elements in the poverty definition despite providing a more comprehensive picture of deprivation. In addition, the different monetary approaches also lead to different profiles of child poverty. Furthermore, although both absolute deprivation and relative deprivation are multidimensional child poverty measures, they cover different domains and inform child poverty differently.

Therefore, it is arguable that different child poverty measurements should be viewed as complementary rather than competitive because they provide different information. For example, the consideration that monetary and non-monetary measures are complementary is supported by many poverty scientists, including those in the Group in Poverty Statistics in Rio de Janeiro. This group consists of poverty experts from developed and developing countries (Rio Group, 2006) who highlight the importance of combining deprivation and monetary poverty statistics as the best practice for measuring poverty. Likewise, Bradshaw (2001) states that different measures, monetary and non-monetary, can be analysed together because they complement each other to provide a more holistic view of child poverty.

The common approach for analysing different measures is through comparison of the extent and nature of each measure, domain, or indicator. The typical strategy is comparing the monetary and non-monetary child poverty rates (Advis and Rico, 2012; Roelen, 2010; 2017; Roelen et al., 2012) or various multidimensional child poverty rates (Yousefzadeh, 2013; Yousefzadeh et al., 2012). A comparison with a broader set of indicators was illustrated by the 3-dimensional (3D) well-being approach (Jones and Sumner, 2011). The 3-

dimensional approach proposes a more holistic approach for measuring child poverty. Namely, this approach puts children and their agency at the centre, encouraging positive perspectives of children (by not labelling them as poor) and integrating relational and subjective dimensions into the material dimension. These dimensions are interdependent. The 3D well-being approach also covers material needs, social needs, and psychological needs, similar to the measurement of relative deprivation. In this context, Jones and Sumner (2011) compare the different levels of deprivation through the lens of material needs, social needs, and psychological needs.

Analysing the overlaps (the extent of agreement) as well as differences among measures, domains, or indicators provides additional information to unpack the nature of child poverty. The overlaps inform the extreme situation of children who face different types of poverty (Bradshaw and Finch, 2003; Roelen and Notten, 2013). However, the discrepancies between measures indicated that each method provided a different picture of poverty (Bima and Marlina, 2017; Bradshaw and Finch, 2003; Roelen, 2010; 2017; Roelen et al., 2012).

Comparison of estimates is very important because different measures identify child poverty differently with different policy consequences. In Indonesia, the target recipients of social protection are mainly decided based on household-based monetary poverty. Several investigations have shown that many poor children do not receive social protection intervention support often due to the issues surrounding the targeting methodology used to identify the poor (SMERU, 2011; Sparrow, 2006; TNP2K, 2014).

Additionally, the comparison between different methods using empirical data with the overlaps and discrepancies of different measures provides better insights into whether the methods can replace others. Moreover, the comparison accommodates a more robust discussion of the strengths and weaknesses of each method. Hopefully, this comparison will be helpful in identifying the most appropriate methods in this case (given the context and data available).

The three child poverty measures that are compared in this chapter are monetary child poverty (MCP) assessed by child equivalised household expenditure using the BPS poverty threshold (see CHAPTER 5) and two multidimensional child

poverty (MDCP) measures (absolute deprivation using deprivation in two indicators as a threshold (see CHAPTER 6) and relative deprivation using the item response theory (see CHAPTER 7)). The indicators, aggregation, and thresholds used in each measure are shown in Table 8-1.

Table 8-1. Comparison of selected child poverty indicators and thresholds

	Monetary Measure	Multidimensional Child Poverty	
		Absolute Deprivation	Relative Deprivation
Indicator Items	• Food Expenditure (Age 0-17) • Non-food expenditure (Age 0-17)	• Shelter (Age 0-17) • Sanitation (Age 0-17) • Drinking water (Age 0-17) • Education (Age 7-17) • Information (Age 3-17) • Food (Nutrition) (Age 0-4) • Health (Age 0-15)	• No mobile phone (Age 13-17) • No Internet access (Age 13-17) • No TV (Age 0-17) • Did not go to school or finish primary education (Age 13-17) • Inadequate flooring (Age 5-17) • House surrounded by human and animal waste (Age 0-4 & 7-12) • Using surface water for drinking (Age 0-17) • House lacks access to improved sanitation (Age 0-17) • House without electricity (0-17) • Household doesn't use clean cooking fuel (0-17) • Household lacks transport vehicle (0-17)
Aggregation	Sum of household expenditure	Raw sum score of deprivation at domain level indicators	• Raw sum score deprivation at sub-domain level indicators • 2-parameter logistics IRT estimates
Composite Indicator	Equivalised expenditure (household expenditure divided by equivalised scale)	Number of deprivations experienced by children	• Number of deprivations experienced by children • IRT factor score
Thresholds	Absolute poverty threshold	Deprived in two indicators or more	Deprived in two indicators or more (except age 7-12 that use deprived in 3 indicators and more)

Table 8-1 shows how the indicator items, composition, and thresholds vary by measure, reflecting their different theoretical positions. The monetary measure using expenditure is the indicator. Absolute and relative deprivation indicator items reflect types of resources and consequences of lacking monetary

resources. Absolute deprivation indicators were identified based on the UN Convention on the Rights of the Child (UNCRC) without considering reliability and validity as the basis for selecting indicators (see CHAPTER 6). Relative deprivation indicators were selected from a set of possible indicators that were identified from qualitative studies and then tested by reliability and validity tests (see CHAPTER 7). This means that reliability and validity tests of absolute deprivation were conducted to evaluate the measure, while for relative deprivation, reliability and validity tests were not only used for evaluating the measures but also for selecting the indicators. Indicators that were unreliable and not valid were excluded from the final list of relative deprivation indicators.

8.1.1 **Strategy to Compare Populations Identified as Poor by Each Measure**

Descriptive analysis was the starting point of the comparison of monetary and non-monetary child poverty. This includes estimates in subgroups based on different characteristics, such as urban and rural regions or education of the head of household. This comparison is mainly carried out to investigate the disparity among subgroups.

The main strategy used to compare different child poverty measures was to explore joint distribution. As illustrated by Ferreira (2011) and Ferreira and Lugo (2013), the analysis of joint distribution is a response to the debates regarding the utilisation of a “dashboard approach” (Ravallion, 2011) and of aggregating multiple indicators into a single index (Alkire and Foster, 2011a; b; Alkire and Roche, 2012). The joint distribution focuses on the probability of a combination among the observed poverty indicators.

In practical terms, joint distribution is commonly interpreted as the analysis of overlaps and discrepancies. Investigating overlaps and discrepancies shows whether the different measures identify the same or different children as living in poverty. Overlaps of the child poverty measures demonstrate which children experience multiple types of poverty based on different standards. The overlaps also reveal the level of agreement among measures. Discrepancies indicate the differences among poverty measures, showing which children are deprived based on one measure but not deprived according to other measures.

The following strategies were applied to explore the overlaps and discrepancies among the monetary measure, absolute deprivation, and relative deprivation.

- The first strategy was to investigate the overlaps of child poverty measures. Inspired by Roelen (2010; 2017; 2012), the overlaps and discrepancies are summarised in a Venn diagram and bivariate tabulation. The Venn diagram (see subsection 8.2.1.1) shows the proportion of children who are deprived according to all three measures, deprived in only two of the measures, or deprived in only one measure as the indication of discrepancies. The bivariate tabulation investigated the extent of children who are poor in one measure and also poor in other measures.
- The second strategy was to investigate the correlation between absolute deprivation, relative deprivation, and monetary child poverty measures to confirm the level of agreement among those measures.
- The third strategy was to compare the proportion of poor children. It involved the comparison of child poverty rates according to each measure and of children who experience absolute and relative deprivation based on monetary child poverty status. This comparison allows for disparities by child, household, or regional characteristics to be explored.

8.1.2 Strategy to Evaluate the Performance of Child Poverty Measures

Several different methods were applied to judge the appropriateness, usefulness, and rigour of these measures. Chapter 2 discussed the strengths and weaknesses of different approaches to child poverty measurement from the theoretical perspective. The conceptual comparison suggests that child poverty measures are context specific.

The measures can be considered useful when they are able to serve a specific purpose. In other words, the measures are useful when they fit the information needed. For example, a useful measure can contribute to filling knowledge gaps or can be used for policymaking.

A measure is more appropriate in a specific context when it fits and performs well within any specific limitations. For example, an appropriate measure can perform well even if some data are unavailable, as is often the case due to the cost and timeliness of collecting primary data (Constantine and Ponterotto, 2006). In

different contexts or to serve different purposes, different measures might be more appropriate.

Previous chapters discussed the rigour of the measures from methodological perspectives. In CHAPTER 5, absolute and relative poverty thresholds were compared, and the robustness of the measures was investigated. In CHAPTER 6 and CHAPTER 7, the reliability and validity of absolute and relative measures were evaluated.

8.1.2.1 Sensitivity, Specificity, and Predictive Values

In designing diagnostic measures, it is important to consider the accuracy of measurement. An accurate measure of child poverty should identify all children who are poor and not identify any children who are not poor. Referring to the examples from Akobeng (2007a) and Banoo et al. (2006) in medical studies, there are some concepts of diagnostic accuracy that can be applied in this thesis. The proportion of truly poor cases diagnosed as poor by child poverty measures, which is a 'true positive', is known as sensitivity. The proportion of non-poor cases diagnosed as non-poor by the child poverty measures, which is a 'true negative', is known as specificity. The proportion of the people who are diagnosed as poor by poverty measures who are truly poor is known as positive predictive value. The proportion of children who are diagnosed as non-poor by poverty measures who are truly non-poor is known as negative predictive value.

The accuracy of the monetary, absolute deprivation, and relative deprivation measures were assessed based on sensitivity, specificity, and predictive values. The highest possible score of the sensitivity, specificity, positive predictive value, and negative predictive value is 100%. Values below 50% would be considered low accuracy. As illustration, a sensitivity of 80% means that 80% of children who are genuinely poor have been diagnosed as poor. A specificity of 85% means that 85% of children who are genuinely non-poor have been diagnosed as non-poor. A positive predictive value of 75% means that 75% of children who were diagnosed as poor by the poverty measures are truly poor. A negative predictive value of 60% means that 60% of children who were diagnosed as non-poor are truly non-poor.

8.1.2.2 Receiver Operating Characteristics (ROC) Curve

Since the selection of the thresholds for each measure is also reflected in the different methods, the sensitivity and specificity were confirmed based on the ROC curve, which is a simple graphical tool used to display the accuracy of diagnostic tests (Akobeng, 2007b). Therefore, the ROC curve can help to quantify the ability of the tests to discriminate between children who are poor and non-poor. The area under the curve can be understood as a combination of sensitivity and specificity. An area under the curve equal to 1.0 indicates perfect accuracy (100% sensitive and 100% specific) while an area under the curve of 0.5 indicates no ability to discriminate cases (50% sensitive and 50% specific) (Akobeng, 2007b; Fan et al., 2005). Diagnostic tests with larger areas under the curve are more accurate (Akobeng, 2007b; Fan et al., 2005; Lasko et al., 2005). However, if ROC curves from two different tests cross at some points, the full area under the curve might not provide adequate evidence to identify the most accurate tests, and further investigation may be required using a different strategy of investigation such as partial area under the curve (Lasko et al., 2005; Zou et al., 2007).

In this thesis, two different strategies were applied to operationalise the ROC curve analysis. Those strategies were distinguished based on the selection of the variables that represented each measure. The first strategy used binary criteria items of each poverty measure. For example, poor and non-poor were used according to the relative deprivation status. This strategy was applied to all measures, including MCP, absolute deprivation, and relative deprivation, to aid the identification of the optimum level of sensitivity and specificity of the measures based on their corresponding thresholds. The second strategy was to conduct diagnostic tests of multidimensional child poverty (MDCP) measures (absolute and relative deprivation) using the number of deprivations experienced by children. Under this strategy, the ROC curve would estimate sensitivity and specificity based on the various levels of thresholds of MDCP, from lowest to highest. This strategy was applied considering that the ROC curve can also confirm the ordinal and continuous outcomes of the test in addition to evaluating the binary outcomes of the tests (i.e. children diagnosed as poor or non-poor by the tests). It also acts as a confirmation of the binary outcomes when there are

conflicting results from binary tests. The ordinal and continuous outcomes help to clarify the various scenarios of sensitivity and specificity and the optimum thresholds based on the combination (Akobeng, 2007b; Lasko et al., 2005; Zou et al., 2007). If the ROC area of any specific measure based on the number of deprivations experienced by children is broader than the ROC area based on binary items, it indicates that the corresponding threshold did not provide the optimum combination of sensitivity and specificity.

8.1.2.3 Identification of Reference Standard.

These concepts work well when cases can be clearly identified, and the measures can be tested against a perfect reference standard of 'true' cases of poverty. Since perfect reference standards are seldom available, the reference standard is usually the best available benchmark and is often the measure that is the most reliable method or most thoroughly tested (Cardoso et al., 2014). However, there is no general agreement on a reference standard of 'true' cases of child poverty, and indeed this question assumes an ontological position that some researchers may reject (that there exists an external truth about poverty). As discussed in CHAPTER 2, each child poverty measure has certain strengths and weaknesses.

Nonetheless, the concepts of specificity and sensitivity do have value in allowing us to compare across measures. The fact that there is no agreement over the 'true' cases of poverty means that the reference standard is imperfect. Accordingly, a pragmatic alternative reference standard should be identified.

There are many possible strategies to use to decide on an alternative reference standard. Theoretical justification can be used to aid this decision. The reference standards can be identified based on the theoretically best measures in a particular situation. One example is the Bristol Method as the reference standard for measuring child poverty based on the human rights perspective (Pemberton et al., 2012; Pemberton et al., 2007). Another example is the use of overlaps between monetary child poverty and multidimensional child poverty as a reference standard for children who are truly poor (Gordon and Nandy, 2012). Additionally, the standard can be identified based on the existing options for a specific purpose, such as comparing a new measure to an existing, accepted

standard. For example, using the government per capita measure as the reference standard and observing how other measures deviate from it.

Another common strategy is the use of the combination of reference tests (Alonzo and Pepe, 1999; Hadgu and Miller, 2001; Naaktgeboren et al., 2013). In health research, this strategy might mean comparing the result of various tests as the basis of judgement to identify whether a person has a disease. In the same way, the standard of the truly poor child can be investigated based on a combination of the child poverty measures. The result of combined tests supposes to reflect the people who are truly poor and truly non-poor. The possible diagnostic threshold based on a combination of child poverty measurement outcomes can be seen in the following table (Table 8-2).

Table 8-2. Possible diagnostic thresholds based on a combination of child poverty measurement outcomes

Measurement Outcomes			Possible Diagnostic Results of Poverty according to following Reference Standards: Strict Criteria, Moderate Criteria, and Relaxing Criteria		
Monetary child poverty (MCP)	Multidimensional child poverty (MDCP) measures				
	Absolute deprivation (AD)	Relative deprivation (RD)	Strict criteria (positive diagnostic of poverty when identified as poor in all measures)	Moderate criteria (the standard to determine positive diagnostic of poverty between strict and relaxing criteria)	Relaxed criteria (positive diagnostic when identified as poor in one of measures)
1	1	1	+	+	+
1	0	1	-	+/-	+
1	1	0	-	+/-	+
0	1	1	-	+/-	+
0	0	1	-	+/-	+
1	0	0	-	+/-	+
0	0	0	-	-	-

Note: 1 means identified as poor by the poverty measures. 0 means identified as non-poor by the poverty measures. + indicates positive diagnostic results of poverty. – indicates negative diagnostic of poverty. +/- means the diagnostic can be positive or negative.

Table 8-2 shows that using strict criteria, the diagnosis of 'poor' is justified when all the tests indicate a positive sign of poverty. However, the strict criteria are a form of strategy to identify a reference standard based on theoretical justification.

The use of strict criteria is relevant to the arguments developed by some studies (Bradshaw, 2001; Roelen, 2017; Roelen et al., 2012) that have suggested people who experience both MDCP and MCP are in a worse situation compared to people who experience only MCP or only MDCP. In other words, those children experiencing both are truly poor. In this case, the overlaps between MDCP and MCP can be used as a reference standard as illustrated by strict criteria. However, the use of overlaps as the reference standard may have underestimated the level of child poverty and overestimated the sensitivity and negative predictive values. Therefore, it may not be appropriate as the reference standard to identify the accuracy of child poverty measures.

The criteria are considered relaxed when the diagnosis as poor is justified when the result shows a positive sign in any of the measures. According to this criterion, poor according to one measure would be adequate as justification that the children are truly poor. The relaxed criteria are also consistent with the human rights-based approach, which argues that all rights are equal and indivisible. Considering the close relationships between poverty and the violation of child rights, children who experience any types of poverty would be considered as poor. However, this justification is not strong as a basis to identify a reference standard to investigate the accuracy of child poverty measures since it may over-estimate the reference level of poverty.

Based on the considerations above, the moderate criteria were chosen to define the reference standard. In theory, there are many possible approaches to identifying the reference standard that fit with moderate criteria such as discrepant analysis, composite reference standards, and latent class analysis. Discrepant analysis evaluates the accuracy of a test through the use of an additional 'resolver' test to resolve discrepant results between the new diagnostic test and the imperfect reference standards. The accuracy is estimated based on the comparison of the test with the improved reference standard (imperfect reference standard replaced by resolver for discrepant results) (Alonzo and Pepe, 1999). The composite reference standard uses the composite combination of tests as a reference standard for a test. In this approach, a test would be compared to the composite criteria of several other tests which are imperfect reference standards (Alonzo and Pepe, 1999; Naaktgeboren et al., 2013). Latent

class analysis is a statistical method to combine the results of multiple tests to obtain a composite reference standard and diagnostic accuracy of each test. Latent class analysis is chosen as the analytic technique here. Latent class analysis assumes there is an unobservable status related to diagnostic test estimates (Alonzo and Pepe, 1999; Collins and Huynh, 2014; Rindskopf and Rindskopf, 1986; van Smeden et al., 2013).

Each method used to define reference standards based on moderate criteria has some weaknesses. When discrepant analysis is used to evaluate a new test, the sensitivity and specificity estimates obtained by discrepant analysis are biased since the estimates of sensitivity and specificity are higher than they are supposed to be and favour the new test (Alonzo and Pepe, 1999; Hadgu, 1996; Lipman and Astles, 1998; McAdam, 2000). The risk of bias on discrepant analysis is high even if the perfect gold standard test is used as the resolver of the discrepancy (Alonzo and Pepe, 1999; Hadgu, 1996; Lipman and Astles, 1998; McAdam, 2000). Referring to previous studies (Hadgu, 1999; Hadgu and Miller, 2001), the procedure of discrepant analysis is also considered unscientific because, in addition to providing upwardly biased estimates, it violates the fundamental principle of diagnostic testing, which is that the new test should not be used in the determination of the 'true' poverty status. In the context of discrepant analysis, the definition of the true poverty status also depends on the new test since the resolver test is only used when there are differences between the new test and the reference standard in some observed cases. However, when composite reference standards are more valid than discrepant, and when they can even be considered as a valid alternative of an imperfect gold standard, the standards require highly sensitive and specific resolver tests if the reference standard has low sensitivity in specific age groups (Baughman et al., 2008). Latent class analysis can be considered to produce more a robust reference standard than discrepant analysis. Although it requires a statistical approach to model an unobservable latent status of poverty that is more complex than the composite reference standard and sensitivity, latent class analysis allows estimation of sensitivity and specificity as an integral part of the model, in addition to prevalence and covariates (Baughman et al., 2008).

Latent class analysis was selected to identify the reference standard. In addition to providing more accurate estimates as mentioned above, latent class analysis has more consistent items for identification of a reference standard compared to discrepant analysis and composite reference standard. To generate the reference standard, latent class analysis would include all observed variables to be reference variables with a minimum of three diagnostic tests (Alonzo and Pepe, 1999). Thus, this thesis used all of the measures (MCP, AD, and RD) as reference standards.

8.1.2.4 Summary of the Selected Evaluation Strategy

In summary, this chapter estimated sensitivity and specificity and used receiver operating characteristics (ROC) curves to compare the child poverty estimates (MCP, AD, RD) to a reference standard based on latent class analysis. A comparison based on geographic characteristics was carried out to confirm whether the ROC estimates are context specific.

8.2 Empirical Results

Each measure reported in previous chapters shows a different child poverty rate: 10.43% of children are judged poor according to the monetary approach, 17.3% according to the absolute deprivation approach, and 25.74% according to the relative deprivation approach. Table 8-3 shows the comparison of total child poverty rates in a range of subgroups in greater detail.

Table 8-3. Comparison of monetary, absolute and relative Deprivation child poverty rates by individual, household and geographic characteristics subgroups.

		Proportion of Poor Children		
		Monetary Child Poverty (MCP)	Absolute Deprivation (AD)	Relative Deprivation (RD)
Sex of the children	Male	10.65	17.05	25.24
	Female	10.20	17.56	26.28
Education level of household head	No schooling or primary dropout	28.17***	43.75***	59.08***
	Primary school	15.54***	23.49***	37.93***
	Junior high school	9.44***	16.86***	23.54***
	Senior high schools	4.30***	9.25***	12.70***
	University	1.34***	5.01***	4.37***
Sex of household head	Male	10.14***	17.42	25.76
	Female	12.37***	16.45	25.62
Religious affiliation of household head	Other religions	20.39***	40.27***	57.79***
	Islam	8.60***	13.07***	19.85***
Occupations of household head	Not working or doing unpaid work	13.26***	15.99**	23.83**
	Doing paid work	9.85***	17.56**	26.13**
Value of household assets (quintile range in Indonesian million Rp.)	Lowest (0–12.8 M)	17.14***	28.12***	42.64***
	Lower (12.8–40.8 M)	15.90***	24.77***	38.06***
	Medium (40.8–96.5 M)	9.81***	16.64***	24.92***
	Higher (96.5–222 M)	6.60***	10.30***	15.42***
	Highest (>222 M)	2.44***	6.32***	7.09***
Areas	Urban	6.87***	6.64***	7.85***
	Rural	13.97***	27.92***	43.57***
Islands	Java	8.61***	10.83***	15.50***
	Outside of Java	12.67***	25.27***	38.37***
Total		10.43	17.30	25.74

Note: *** is significant at 0.01, ** is significant at 0.05.

Table 8-3 shows that there are no significant differences between estimates of male and female child poverty in any measures. Similarly, no differences were observed based on the sex of the household heads. However, differences exist when comparing child poverty rates based on the education level of the head of household, religious affiliation of the household's head, the occupation of the head of household, religious affiliation of the household's head, and household assets. Poverty rates also differed depending on household location, whether urban or rural, as well as whether they are living in Java or on other islands of Indonesia. Consistent with all measures, children whose heads have little education have higher rates of deprivation than those with more education. Children in the household with fewer assets have higher rates of deprivation than those with greater assets. Children living in rural areas have the highest rates of deprivation, and children living on islands other than Java have a higher level of deprivation than those in Java. However, based on the regression test in previous chapters (CHAPTER 6 subsection 6.2.5 and CHAPTER 7 subsection 7.2.3), there is no association between the occupation of the head of household and deprivation (AD and RD) when controlling for other variables.

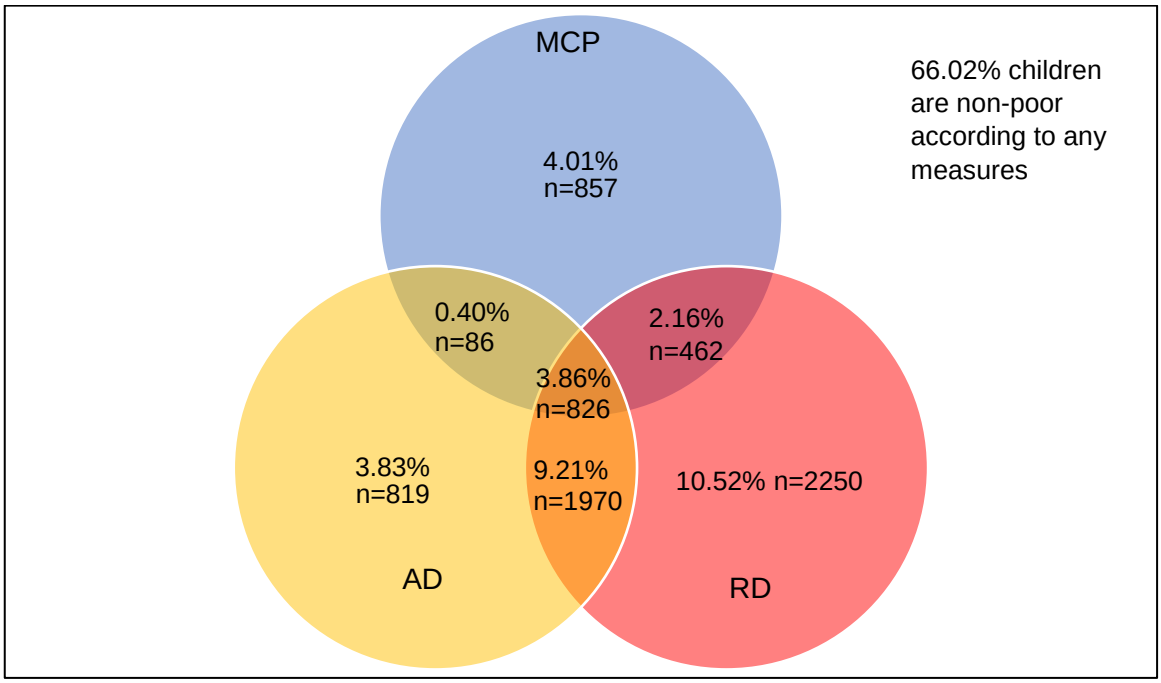
8.2.1 **Agreement and Differences among Child Poverty Measures**

The agreement and differences among poverty measures are useful to determine consistency among measures.

8.2.1.1 Analysis of Total Sample

The overlaps (agreement and differences) of these measures are shown in the Venn Diagram of poor children in *Figure 8-1*.

Figure 8-1. Venn diagram comparing child poverty estimates.



Note: MCP=Monetary Child Poverty, AD=Absolute Deprivation, RD=Relative Deprivation. Total number of children=21396. Number of non-poor children according to any measures=14,286. Number of poor children in at least one measure=7,271 (Proportion of poor children 33.98%). Number of children who are non-poor according to any measures: 14,125.

There is poor agreement across measures. *Figure 8-1* shows that among all children, 33.98% are poor in any one of the measures. However, only about 3.86% of children are poor based on all three measures. Poor agreement seems to be caused by small overlaps between monetary child poverty and multidimensional child poverty (especially with absolute deprivation). Only about 4.26% of children are poor according to both monetary child poverty (MCP) and absolute deprivation (AD).

The discrepancy is highest for relative deprivation. Considering all poor children, *Figure 8-1* shows about 10.52% of children experience only relative deprivation, whereas 3.83% and 4.01% of children experience only absolute deprivation and only monetary child poverty respectively. Further investigation of discrepancies is illustrated in Table 8-4. Among the poor children, Table 8-4 shows the proportion of children who experience other types of child poverty.

Table 8-4. Proportion of poor children based on different child poverty measures according to different child poverty status.

Child Poverty Status	Proportion of Children Experienced Monetary Child Poverty (MCP)	Proportion of Children Experienced Absolute Deprivation (AD)	Proportion of Children Experienced Relative Deprivation (RD)
Poor children according to Monetary Child Poverty (MCP)	100.00	40.86	57.74
Poor children according to Absolute Deprivation (AD)	24.63	100.00	75.54
Poor children according to Relative Deprivation (RD)	23.39	50.76	100.00

Absolute deprivation (AD) has close relationships with relative deprivation (RD) but not with the monetary child poverty (MCP) measure. Table 8-4 shows that more than 75% of children who experienced AD also experience RD. However, only 25% of those who experienced AD also experienced MCP. In addition, 40.86% of children who experience MCP also experience AD, but only 24.63% of children who experience AD also experience MCP.

Nevertheless, the overlaps between MCP and RD seem to be higher than the overlaps between MCP and AD. About 58% of children who experience MCP also face RD. However, since the prevalence of MCP is much lower compared to RD, only 23% of children who experience RD also experience MCP. To support the analysis above, Table 8-5 illustrates tetrachoric correlation among child poverty measures.

Table 8-5. Correlation between child poverty measures

	Monetary Measure (MCP)	Multidimensional Child Poverty (MDCP)	
		Absolute Deprivation (AD)	Relative Deprivation (RD)
Monetary Measure	1.000		
Absolute Deprivation	0.415	1.000	
Relative Deprivation	0.516	0.784	1.000

Small overlaps are also indicated by low correlation. Consistent with the low overlaps between MCP and deprivation measures (AD and RD), Table 8-5 shows that the correlation between MCP and deprivation (both AD and RD) are relatively low (about 0.4 and 0.5 respectively). Conversely, the correlation between AD and RD is relatively high (almost 0.8).

8.2.1.2 Subgroup Analysis

To explore the agreement and differences among different groups of children, Table-8-6 repeats the subgroups in the samples of children who experienced more than one type of poverty, especially comparing the proportion of children who experience absolute (AD) and relative deprivation (RD) according to monetary poverty status in each subgroups. This analysis compares the characteristics of monetarily poor children versus monetarily non-poor children in regard to deprivations. The differences within each subgroup were tested using ANOVA.

Table-8-6. Comparison of absolute and relative deprivation child poverty rates based by monetary child poverty status and individual, household and geographic characteristics subgroups.

		Proportion of Children Experienced Absolute Deprivation (AD)		Proportion of Children Experienced Relative Deprivation (RD)	
		MCP Poor (n=2,533)	MCP Non-Poor (n=18,863)	MCP Poor (n=2,533)	MCP Non-Poor (n=18,863)
Sex of the children	Male	40.27	14.28	57.05	21.45
	Female	41.51	14.84	58.50	22.62
Education level of household head	No schooling or primary dropout	61.36***	36.83***	77.05***	52.03***
	Primary school	38.74***	20.69***	57.53***	34.32***
	Junior high school	35.69***	14.89***	49.63***	20.82***
	Senior high schools	40.42***	7.85***	53.82***	10.86***
	University	22.30***	4.66***	33.90***	3.78***
Sex of household head	Male	43.93***	14.43	59.57***	21.95
	Female	23.82***	15.40	47.56***	22.52
Religious affiliation of household head	Other religions	73.13***	31.86***	91.72***	49.10***
	Islam	26.78***	11.78***	42.90***	17.68***
Occupations of household head	Not working or doing unpaid work	28.07***	14.15***	44.64***	20.65***
	Doing paid work	44.37***	14.63***	61.33***	22.28***
Value of household assets (quintile range in Indonesian million Rp.)	Lowest (0 -12.8M)	51.08	23.22***	72.23	36.27**
	Lower (12.8-40.8M)	45.49	21.27***	65.80	33.61**
	Medium (40.8-96.5M)	32.87	15.04***	46.98	22.70**
	Higher (96.5-222M)	19.08	9.77***	30.92	14.33**
	Highest (>222M)	35.80	5.53***	25.80	6.62**
Areas	Urban	15.47***	5.99***	21.97***	6.81***
	Rural	53.29***	23.79***	75.25***	38.42***

		Proportion of Children Experienced Absolute Deprivation (AD)		Proportion of Children Experienced Relative Deprivation (RD)	
		MCP Poor (n=2,533)	MCP Non-Poor (n=18,863)	MCP Poor (n=2,533)	MCP Non-Poor (n=18,863)
Islands	Java	24.13***	9.58***	36.62***	13.52***
	Outside of Java	54.87***	20.98***	75.43***	32.99***
Total		40.86	14.55	57.74	22.02

Note: *** is significant at 0.01, ** is significant at 0.05.

In general, monetarily poor children have a greater chance of experiencing absolute deprivation and relative deprivation compared to monetarily non-poor children. The situation exists consistently in almost all subgroups such as the education level, religious affiliation, and occupation of heads of households and household location, whether urban or rural as well as whether they are living in Java or other islands of Indonesia.

The consistency of the measures indicates some level of theoretical robustness in the context of poverty comparison. Children with educated heads of household have a lower proportion of absolute and relative deprivation. Children with Muslim heads of household have a lower level of deprivation. Children who are living in urban areas and also in Java are less likely to experience deprivation.

For monetarily poor households, asset ownership is not necessarily a reflection of deprivation, especially in the context of absolute deprivation. Table-8-6 shows that there are no significant differences between absolute deprivation prevalence among different quintiles of household assets.

More detail of estimates of the overlaps can be seen in Appendix I (Table I-1), which shows the comparison of the prevalence of monetary poverty based on the interaction between absolute deprivation and relative deprivation. Table I-1 also shows the proportion of children who are deprived based on both absolute and relative deprivation, and the proportion of children who are deprived based on either absolute or relative deprivation according to monetary poverty status.

The consistency of the measures indicates some level of robustness in the context of poverty comparison. The robustness in this context is theoretical robustness where the differences of poverty rate are in the direction expected based on the theory. The exception is the comparison based on the occupation of household head. Children whose parents are working have lower monetary

poverty rates. However, those children have more deprivation (both absolute and relative) compared to children whose parents are not working or doing unpaid work. When disaggregated, this is true for both monetary poor and monetary non-poor children.

8.2.2 **Variation in how the Measures Perform in Indonesia**

As introduced in section 8.1.2, the variation in how measures perform in Indonesia is explored through the analysis of sensitivity, specificity, and predictive value, as well as the ROC curve, for the total sample based on geographic characteristics. The geographic characteristics were selected for subgroup comparison because they show consistent differences of poverty rates based on all measures.

8.2.2.1 Analysis of Total Sample

The estimates of sensitivity, specificity, and predictive values of the measures against a latent class reference standard are illustrated in Table 8-7.

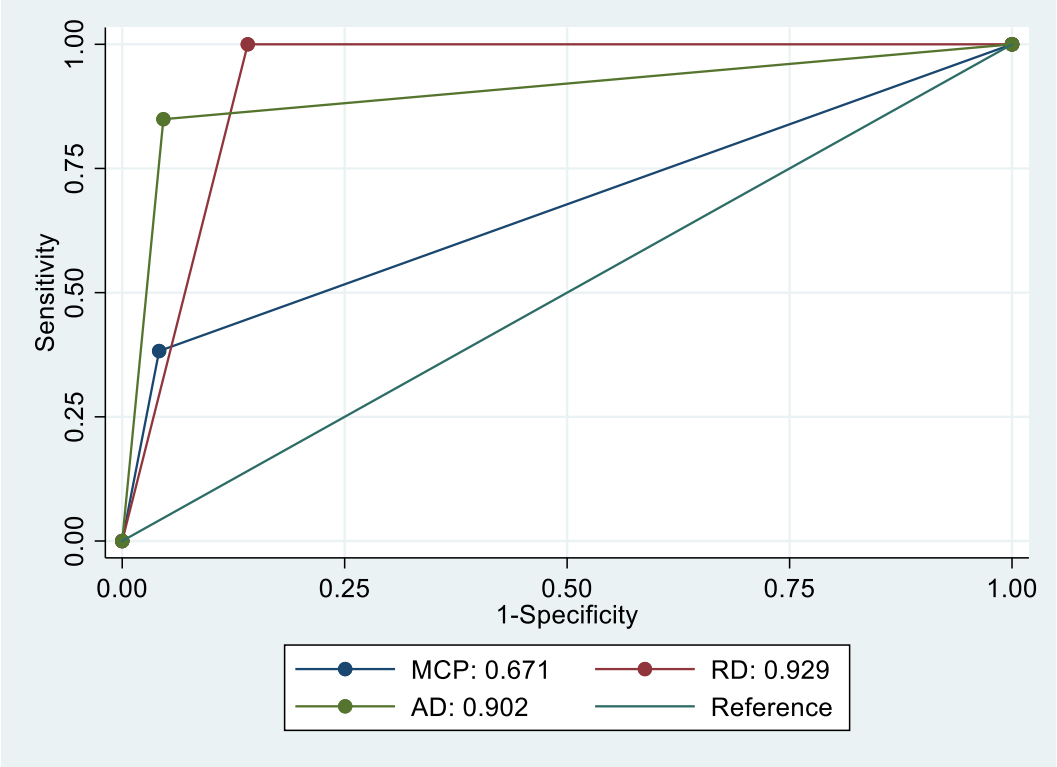
Table 8-7. Sensitivity, specificity and predictive values of total sample.

Diagnostics	Monetary (MCP)	Absolute Deprivation	Relative Deprivation
Sensitivity	38.25%	84.92%	100.00%
Specificity	95.85%	95.37%	85.89%
Positive Predictive Values	64.99%	78.71%	58.80%
Negative Predictive Values	88.51%	96.91%	100.00%

Table 8-7 indicates the trade-off between specificity and sensitivity. Table 8-7 shows relative deprivation has the highest sensitivity (100%) which means that all of the children who are 'truly' poor were diagnosed as poor by the relative deprivation measure (RD). Monetary (MCP) and absolute deprivation (AD) show the highest specificity (96% and 95% respectively) which means that 96% and 95% of children who are 'truly' non-poor were diagnosed as non-poor by MCP and AD. However, the low positive predictive value of RD (59%), means that 59% of children who were diagnosed as non-poor by RD are genuinely poor. The prudent choice is AD, with an acceptable level of accuracy in all domains.

The ROC curves confirm the result of sensitivity, specificity, and predictive values in Table 8-7. The ROC curve based on a binary of poverty status (poor/not poor) according to each measure informs which measures have better accuracy in distinguishing poor and non-poor children. The curve can be seen in *Figure 8-2.*

Figure 8-2. Receiver operating characteristics (ROC) curve of based on child poverty status (poor or non-poor)



Monetary ROC area: Area under ROC curve for monetary child poverty.
AD ROC area: Area under ROC curve for absolute deprivation.
RD ROC area: Area under ROC curve for relative deprivation.

Figure 8-2 shows that the relative deprivation measure (RD) has largest area under the ROC curve (0.929) while the monetary measure (MCP) has the smallest ROC area (0.671). Therefore, the ROC curve cannot confirm the findings of Table 8-7 that absolute deprivation (AD) is the best measure. In addition, MCP can be considered as the least accurate measure. As observed, the difference in ROC area between AD and RD seems to be very small.

To confirm whether the thresholds of absolute and relative deprivation provide the optimum level of sensitivity and specificity, *Figure 8-3* shows further investigation of AD and RD based on numbers of deprivation indicators using the ROC curve.

Figure 8-3. Receiver operating characteristics (ROC) curve of deprivations based on number of deprivation indicators.

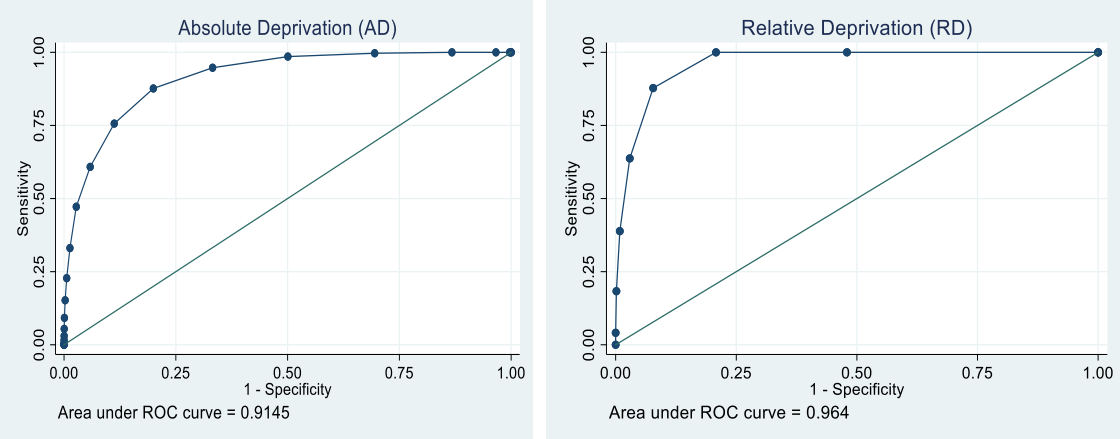


Figure 8-3 shows that when using the number of deprivation indicators instead of the binary status of deprivation, RD has a marginally larger area under the ROC curve (0.96) compared to AD (0.91).

8.2.2.2 Subgroup Analysis

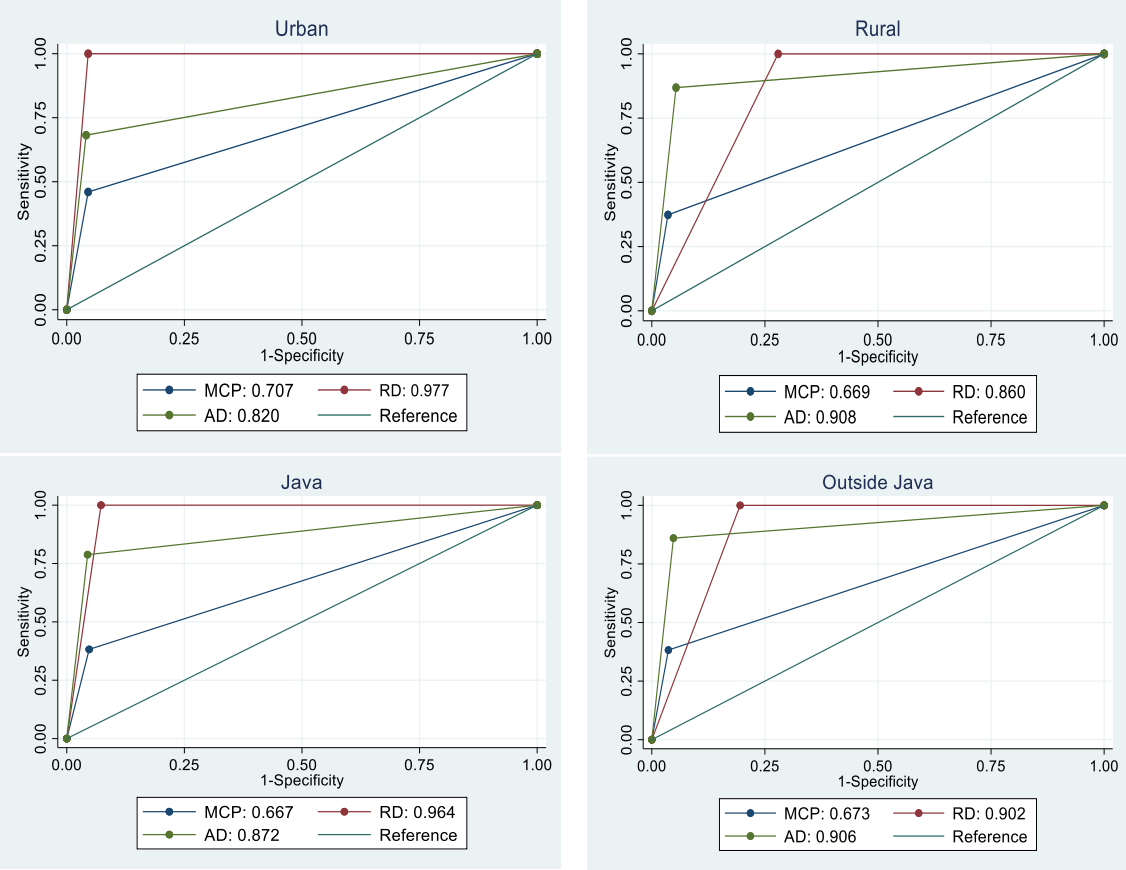
Previous chapters (CHAPTER 5, CHAPTER 6, and CHAPTER 7) show the consistency of disparities based on geographic differences (rural / urban and Java / outside Java). The analysis of robustness also showed large, significant, and consistent subgroup differences based on geography. Therefore, subgroup analysis of sensitivity, specificity, predictive values, and receiver operating characteristics (ROC) curves focus on these same geographic characteristics: urban / rural and Java / outside Java. Subgroup comparisons of the sensitivity, specificity, and predictive values are shown in Table 8-8.

Table 8-8. Sensitivity, specificity and predictive values based on geographic characteristics

Geographic Area	Diagnostics	Monetary (MCP)	Absolute Deprivation (AD)	Relative Deprivation (RD)
Urban	Sensitivity	45.99	68.18	100.00
	Specificity	95.45	95.88	95.45
	Positive Predictive Values	26.42	37.01	43.85
	Negative Predictive Values	98.03	98.83	100.00
Rural	Sensitivity	37.35	86.87	100.00
	Specificity	96.43	94.64	72.07
	Positive Predictive Values	82.19	87.74	61.23
	Negative Predictive Values	77.72	94.23	100.00
Java	Sensitivity	38.21	78.79	100.00
	Specificity	95.24	95.57	92.71
	Positive Predictive Values	35.79	55.26	48.80
	Negative Predictive Values	95.69	98.48	100.00
Outside Java	Sensitivity	38.26	86.02	100.00
	Specificity	96.34	95.22	80.48
	Positive Predictive Values	76.16	84.63	61.06
	Negative Predictive Values	83.60	95.70	100.00

Table 8-8 shows that in all subgroups, relative deprivation (RD) shows the largest estimates of sensitivity and negative predictive values. In urban areas, RD also has the largest positive predictive values and high specificity. This indicates that RD is the best measure for urban areas. However, absolute deprivation (AD) has larger specificity and positive predictive values in rural areas, Java and outside Java. Therefore, Table 8-8 cannot provide conclusive evidence for the best measure in rural areas, Java, and outside Java. In this situation, ROC curves provide additional evidence to identify the best measure (See *Figure 8-4)*.

Figure 8-4. Comparison of ROC curves based on child poverty status (poor or non-poor) by geographic classification



Monetary ROC area: Area under ROC curve for monetary child poverty
AD ROC area: Area under ROC curve for absolute deprivation
RD ROC area: Area under ROC curve for relative deprivation

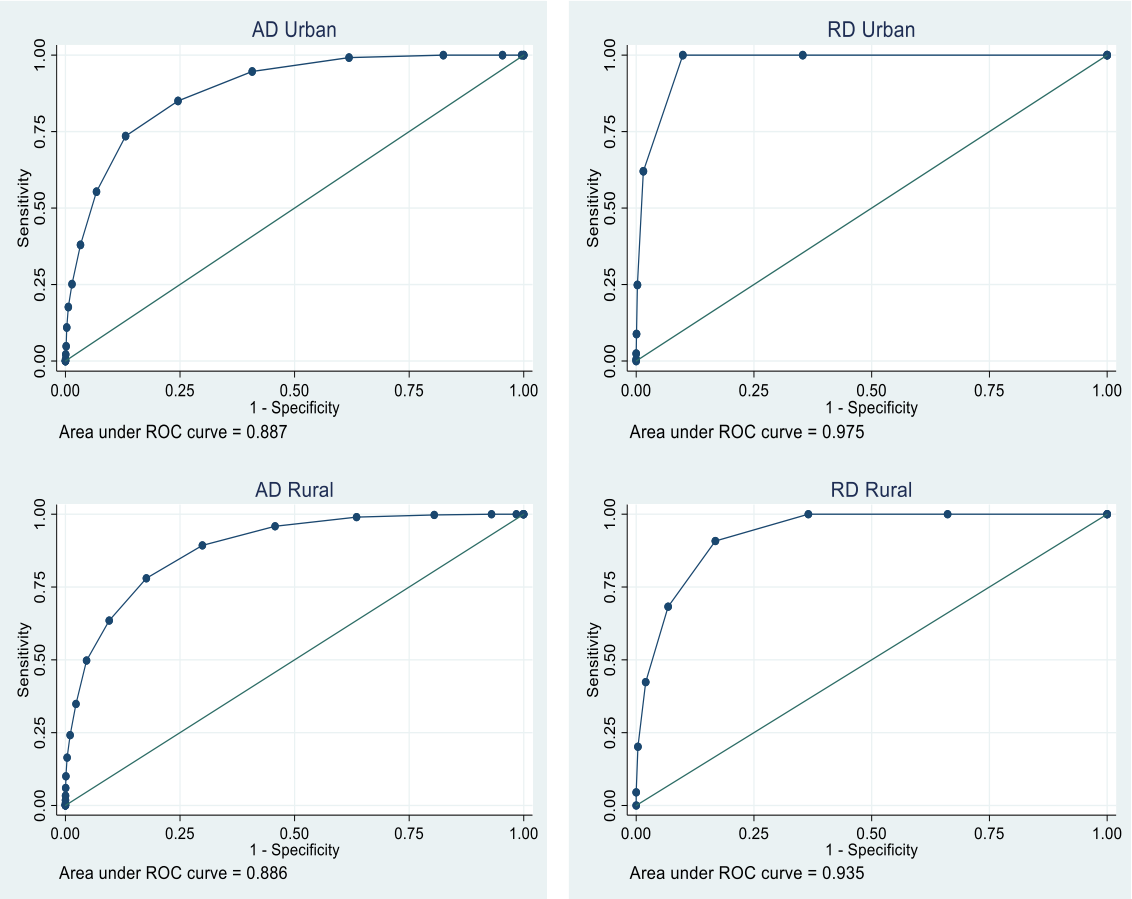
Investigation of ROC curves at the subgroup level shows visible differences between measures. *Figure 8-4* shows MCP has the smallest ROC in all geographic characteristics, indicating that the MCP is consistently the least accurate compared to the other measures. Additionally, RD has the largest ROC area in urban areas (0.98) and Java (0.96). However, AD has largest the ROC area in rural areas (0.91). Furthermore, AD and RD have similar levels of ROC area outside java (0.91)[4].

To confirm whether the thresholds of absolute and relative deprivation provide the optimum level of sensitivity and specificity based on the geographic characteristics, a comparison of ROC curves based on urban and rural is shown

[4] Area under curve of absolute deprivation in outside Java is slightly higher than urban area, however, the differences is very small.

in *Figure 8-5* and the curve based on Java and outside Java is shown in *Figure 8-6*.

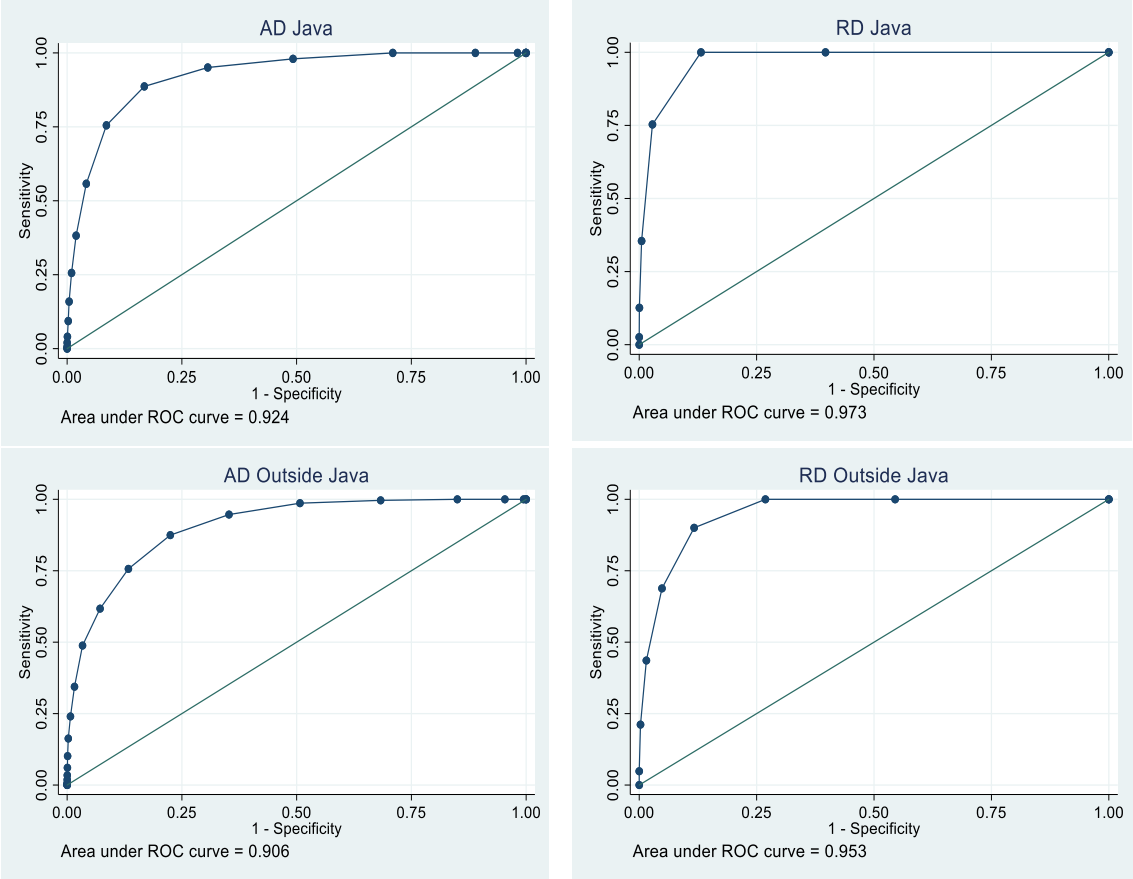
Figure 8-5. Receiver Operating Characteristics (ROC) curves of deprivations based on number of deprivation indicators by region (urban and rural)



Note: AD Urban=Absolute Deprivation in Urban Area. AD Rural=Absolute Deprivation in Rural Area. RD Urban=Relative Deprivation in Rural Area. RD Rural=Relative Deprivation in Rural Area.

Figure 8-5 shows that in urban areas, the ROC of relative deprivation (RD) (0.98) is significantly higher than that of absolute deprivation (AD) (0.89). Even in rural areas, the location where AD had high ROC area when estimated using the thresholds, RD has a higher ROC (0.94) compared to AD (0.89).

Figure 8-6. Receiver operating characteristics (ROC) curves of deprivations based on number of deprivation indicators by islands (Java and outside Java)



Note: AD Java=Absolute Deprivation in Java Island. AD Outside Java=Absolute Deprivation in Outside Java. RD Java=Relative Deprivation in Java Island. RD Outside Java=Relative Deprivation in Outside Java.

Figure 8-6 also shows that RD has a larger ROC area than AD in both Java and outside Java. In Java, the ROC of RD (0.97) is significantly higher than AD (0.92). Similarly, outside Java, RD also has a higher ROC (0.95) compared to AD (0.91).

Findings from *Figure 8-5* and *Figure 8-6* confirmed that RD performs better when using the summed score of the deprivation statistic of rather than the binary of poor or non-poor. The figures also show that the threshold of RD identified in CHAPTER 7 does not provide the optimum level of sensitivity and specificity because, although RD performs better according to ROC based on the summed score of deprivation, the ROC estimates based on the binary inform that RD performs more poorly in rural areas.

In general, the evaluation of the accuracy of the measures indicates contradictory results. The use of latent class analysis suggests that RD has the higher level of

sensitivity and predictive negative values compared to MCP and AD. Furthermore, the analysis of the ROC curves suggests that RD has better accuracy in urban areas and in Java, while AD is more accurate in rural areas, and AD and RD are equally accurate outside Java. However, in general, RD is the best measure.

8.3 Conclusion

The main sources of discrepancies between monetary measure, absolute deprivation, and relative deprivation were differences of indicators and thresholds. However, there were consistencies among them when comparing the disparities that indicate the robustness.

Based on estimates, this chapter argued that deprivation analysis cannot replace monetary measures, **but monetary and deprivation measures are complementary.** The conclusion that monetary measures and deprivation are complementarily is supported by the fact that there is no agreement on the best measure from a methodological perspective. This disagreement indicates the benefit of analysing the overlaps and discrepancies of poverty measures. The overlaps and discrepancies indicate different types of poverty experienced by the children. The children who are in the worst situation are children who are monetarily poor and also deprived.

Diagnostic tests were applied without perfect reference standards using latent class analysis. In general, absolute deprivation has a high level of sensitivity, specificity, and predictive value. However, the analysis of the ROC curves informed that in general, relative deprivation was more accurate for measuring child poverty. Monetary measures consistently had the lowest accuracy in all observed scenarios.

Comparisons of subgroups show that relative deprivation is better compared to absolute deprivation and monetary measures. Sensitivity and negative predictive value of relative deprivation are highest in all subgroups. ROC analysis based on binary estimates inform that relative deprivation would be a better measure for urban areas and Java and performs equally well outside java compared to absolute deprivation. However, absolute deprivation provides better estimates for

rural areas. This result indicates that the relative deprivation measure has better ability to distinguish poor and non-poor children in urban areas which are more developed than rural areas. ROC analysis shows that relative deprivation had better composite indices of deprivations in all geographic sub-groups (urban, rural, Java and outside Java),

This chapter confirmed that different tests lead to different conclusions of which measures are best. The comparison of measures shows the challenge in searching for a “best” method to measure child poverty. The method shown to be most robust in a certain condition could be worse in different conditions. This estimate informs that relative deprivation is the best measures according to sensitivity, specificity, predictive values, and ROC analysis. However, since relative deprivation is not widely tested in Indonesia, considering that each measure excels in a different area, using a combination of measures is recommended.

CHAPTER 9. DISCUSSION AND CONCLUSION

9.1 Summary of Key Findings

This thesis aimed to compare the child poverty measures used to indicate the extent and nature of child poverty and to identify the best measure for the Indonesian context. Using Indonesian Family Life Survey (IFLS) data, child poverty was measured based on monetary and multidimensional approaches. Those approaches were thereby tested to determine whether the child poverty measures indicated the extent and nature of child poverty differently.

The monetary approach compared absolute and relative monetary child poverty based on expenditure. The multidimensional approach applied absolute and relative deprivation measures. The absolute deprivation measure used a human rights-based approach to determine the domain and indicators. The relative deprivation measure identified a preliminary list of items based on domains and indicators from previous studies in Indonesia and then selected reliable, valid, and additive items for analysis. The accuracy of those measures was investigated using latent class analysis to estimate sensitivity and specificity, supported by receiver operating characteristic (ROC) curve analysis.

Using the thesis research questions as a guideline, a summary of key findings is presented in the following sections.

9.1.1 What are the sensible and possible ways to assess child poverty in Indonesia?

It was found that each measure had its own strengths and weaknesses and served its own purpose in measuring child poverty. The measures also informed child poverty differently.

9.1.1.1 What are the conceptually coherent approaches to the assessment of child poverty?

There is no internationally agreed-upon definition or assessment of child poverty. There are various approaches and sets of indicators to measure child poverty. The lack of agreement is also a reflection of the controversies surrounding global standards, national standards, and local standards of child poverty.

The compatibility of the global standard is particularly important in developing country contexts, where measurement of household resources and income may not assess the extent to which children have access to public or community goods.

In such situations, lack of necessities and low standard of living are not always consequences of a lack of household resources, but rather due to the lack of public resources (such as schools). In addition, some consider that child poverty should account for local regulations, policies, and public views.

Therefore, a comparison of child poverty measures helps to understand how global standards of child poverty (such as the human rights-based approach (Gordon and Nandy, 2012; Gordon et al., 2003; Pemberton et al., 2012; Pemberton et al., 2007) provide a different picture of child poverty compared to the localised measures. In this case, monetary and deprivation measures were compared and tested, and in both cases, both absolute and relative approaches were applied. A more detailed discussion of those approaches is presented in the next subsection.

9.1.1.2 What data are available and, therefore, which of the conceptually coherent approaches are possible?

The data available in Indonesia are the national socio-economic survey (SUSENAS) (BPS, 2015b), the demographic and health survey (DHS) (BPS, 2012a), and the Indonesian Family Life Survey (IFLS) (Sikoki et al., 2013; Strauss et al., 2016a; b). SUSENAS (BPS, 2015b) and the Indonesian Family Life Survey (IFLS) (Sikoki et al., 2013; Strauss et al., 2016a; b) provide the household expenditure data needed to estimate monetary poverty.

Multidimensional measures of child poverty require data on various indicators of child poverty and deprivation and some household- and some individual-level indicators. Since the data used should cover those indicators, the Indonesian Family Life Survey (IFLS) (Sikoki et al., 2013; Strauss et al., 2016a; b) and the DHS (BPS, 2012a) were used to meet these requirements.

Since both monetary and multidimensional aspects of child poverty are analysed using the same sample, only the Indonesian Family Life Survey (IFLS) (Sikoki et al., 2013; Strauss et al., 2016a; b) can provide both sets of data. Therefore, both

the fifth wave of the IFLS (IFLS 5), which covered western and central parts of Indonesia (Strauss et al., 2016a; b), and the IFLS East, which covered the eastern parts of Indonesia (Sikoki et al., 2013), were used.

However, although the IFLS 5 and IFLS East form a comprehensive dataset, they cannot cover some indicators in the analysis due to data limitations. Limitations in data are also a major issue for poverty measurement in developing countries; therefore, any poverty measure should find the best way to deal with this challenge (Alkire, 2014; IEAG, 2014; Serajuddin et al., 2015; World Bank, 2015b).

Considering the limitations of the data available, a pragmatic selection of indicators was needed. Information on socially perceived necessities was not used for analysis of relative deprivation because the data are not available.

Considering the data availability, there were three feasible approaches:

- Monetary child poverty (MCP): In this thesis, the selection of MCP was convenient, because monetary measures also represent the common understanding of poverty measures already applied in Indonesia (Priebe, 2014).
- Absolute deprivation (AD): Absolute deprivation is the application of the measurement of multidimensional child poverty based on a global context. The absolute deprivation measure was operationalised through a human rights-based approach.
- Relative deprivation (RD): Relative deprivation is the application of the measurement of multidimensional child poverty based on a local context. The key strength of this methodology is that it acknowledges the public views of child poverty to identify indicators. This method is a better reflection of the local perspective compared to absolute deprivation.

9.1.1.3 What indicators should be used to define and assess poverty according to each of these approaches?

Each approach applied different sets of child poverty indicators.

<u>Monetary child poverty (MCP): Absolute and relative</u>

- The analysis applied equivalence scales in both absolute and relative monetary child poverty.
- The equivalised expenditure was the preferred indicator for the monetary measures compared to the per capita approach, because equivalised expenditure better acknowledges household composition.
- Equivalised expenditure was calculated by multiplying total household expenditure by the equivalised scale.
    - Total household expenditure was estimated using the summation of food and non-food expenditures.
    - The equivalised scale was based on the estimation by Pokhrel (1995).
- The absolute threshold for MCP uses Statistics Indonesia's (BPS's) poverty line because it is widely accepted and tested in Indonesia (BPS, 2017b; 2018b; Cahyat, 2004; Maksum, 2004; Priebe, 2014). The main indicator was the equivalised measure of the BPS poverty line. As a benchmark, a per capita measure of the BPS poverty line was applied.
- The relative thresholds for MCP were 60% of the national median and 60% of the provincial median because in many countries, income or expenditures below 60% represent hardship (de Vos and Zaidi, 1998; European Commission, 2011; Eurostat, 2018; Mack, 2016).

<u>Absolute deprivation (AD):</u>

- The indicators were selected based on the Bristol Method, which covers seven domains: Shelter, sanitation, drinking water, education, information, food (nutrition) and health.
- The reliability, validity, and additivity of the measure was evaluated.
    - The reliability test indicated that the measure has low internal consistency because of low inter-item correlation.
    - All the items are valid.
    - The additivity was not a concern because the issue in interaction effect is not crucial.

- Since the aim of the absolute deprivation measure is to analyse child poverty based on existing measures, not to identify a new set of indicators, no items were removed based on the reliability, validity, and additivity tests.
- Raw sum score was used to generate an index of absolute deprivation.
- Based on the estimates of the various levels of thresholds using ANOVA and logistic regression, the threshold for identifying poor children was found to be two items. Children deprived of two items or more were considered as experiencing absolute deprivation.

Relative deprivation (RD):

- Relative deprivation indicators are based on public views.
- However, since socially perceived necessities data were not available, it was not possible to use socially perceived necessities as previous studies have done (Barnes and Wright, 2012; Guio et al., 2012; 2018; 2017; 2016; Main, 2013; Main and Bradshaw, 2014; Nandy and Pomati, 2015).
- Consequently, public views were captured in alternative ways, namely through various studies that have collected children's and adult's perspectives and experiences of child poverty, as a basis for identifying potential indicators.
- Capturing information from studies conducted in various locations in Indonesia helped to improve the credibility of the indicators.
- The indicators not supported by the data were excluded, and remaining indicators were used as preliminary items for the analysis.
- Analysis of relative deprivation relies on reliability and validity tests to confirm the selection of indicators. The items that were not valid and not reliable were removed from the list of indicators. Therefore, the final set of items for relative deprivation measurement has a high level of reliability. The alpha and omega scores of the relative deprivation measure are greater than 0.7. However, some items were eliminated during the reliability and validity tests and removed from the list of final indicators.
- Similar to absolute deprivation, relative deprivation also utilised raw sum scores for creating an index of deprivation. However, during the estimates of relative deprivation, attention was also drawn to the fact that item

response theory (IRT) has been underused in poverty research. IRT has potential not only as a supplement to the reliability test as applied in previous studies (Guio et al., 2012; 2018; 2017; 2016) but also as a basis for developing a composite index of relative deprivation based on a factor score. Therefore, in addition to using raw sum score, IRT was also applied to guide decisions about indicator inclusion and to inform the development of a composite index.

- Based on the estimates of the various threshold levels using ANOVA and logistic regression, this chapter found that the threshold for identifying poor children is two items. Children who are deprived of two items or more are experiencing relative deprivation.

9.1.2 How do estimates of child poverty in Indonesia vary among these different methods?

The results presented here show that different measures provide different pictures of child poverty. The variations in child poverty rates are a result of the differences in measures, indicators, and thresholds.

9.1.2.1 What is the extent of child poverty identified by each method?

Each measure informed different levels of child poverty rates. More children are poor according to relative deprivation compared to the other measures. It is estimated that a quarter (25.74%) of children are poor based on relative deprivation, which is higher than the estimate based on monetary poverty (10.43%) or absolute deprivation (17.3%). The estimated population of 0-17 years old children in Indonesia for 2017 is 83,665,000 (Kementerian Pemberdayaan Perempuan dan Perlindungan Anak, 2018). Based on the child poverty rates above, it can be estimated that about 8.7 million, 14.5 million, and 21.5 million Indonesian children experience monetary poverty, absolute deprivation, and relative deprivation respectively.

These estimates are a bit different from the findings of other studies. Using SUSENAS data, UNICEF (2017a) estimates that 13.3% of children are poor according to monetary child poverty based on the BPS per capita poverty line (a bit higher compared to the per capita estimate of this thesis, which is 11.6%).

Other studies show a much higher level of multidimensional poverty compared to the estimates of absolute deprivation found in this thesis. Using MODA and SUSENAS 2016, BPS (2017a) and UNICEF (2017a) found that 65% of children are shown to be deprived in two indicators or more. Although those studies use the same threshold used here (i.e. deprived in at least two indicators), their estimates are much higher than those found this thesis. In addition to the use of a different dataset, the discrepancies are caused by the fact that MODA uses a wider set of indicators. For example, MODA also covers early childhood education and child protection (birth certificates, early marriage, and child labour). Another estimate based on the Bristol Method using SUSENAS 2013 (SMERU, 2011) also found a higher child poverty rate (29%). The discrepancy in this case is due to differences in the data sources and also to differences in indicators. SMERU (2011) added child labour as a supplemental indicator. The child labour indicators were not included in the estimates because they are not in the original list of the Bristol Method's indicators for absolute deprivation and also did not pass the reliability and validity test for relative deprivation.

When analysing the differences in poverty rates, it also needs to be acknowledged that deprivation in some indicators was defined differently in other studies. For example, the differences can be seen in the indicators of water and sanitation. Several studies (Bima and Marlina, 2017; BPS, 2017a; SMERU, 2011; UNICEF, 2017a) have used *access to improved sanitation* and *access to improved water sources* for sanitation and water indicators. However, more severe standards have also been used, such as *don't have toilet* to define deprived of sanitation and *use surface water for drinking water sources* to define deprived of water when measuring absolute deprivation. In this thesis, "using surface water for drinking" was chosen as the indicator of water because the indicator of *access to improved water source* used in other studies views the use of bottled water as an indicator of deprivation. Based on the Indonesian context, however, drinking bottled water is not an appropriate criterion for detecting deprivation with regard to child poverty measures. Since the price of bottled water is expensive according to Indonesian standards, the use of bottled water for drinking cannot reflect poverty. Therefore, it can be acknowledged that both the

selection of indicators and the data sources are important factors in determining child poverty rates.

9.1.2.2 What is the profile of child poverty identified by each method?

The profile of poverty differs among methods, with some groups having a larger probability of being poor. In general, those disparities confirm the findings from the previous studies in Indonesia (Bima and Marlina, 2017; SMERU, 2011). The elements of the disparities are as follows:

- Across all measures, children whose head of household has low education have a higher level of child poverty rates. This is an expected finding that is consistent with the other studies in the Indonesia context (SMERU, 2011; UNICEF, 2017a).
- Children whose head of household is non-Muslim have higher levels of deprivation. The majority of the population in some of the poorest provinces outside Java (like Papua, West Papua, and East Nusa Tenggara) in Indonesia are non-Muslim (Ananta et al., 2014). However, in the context of monetary child poverty in urban areas and in Java, children whose head of household is non-Muslim have much lower child poverty rates compared to those with Muslim heads of household. 4.1% and 2.6% children whose head of household is non-Muslim are monetarily poor as well as 7.1% and 7.1% children whose head of household is Muslim are monetarily poor in urban are and in Java respectively. In addition, the upper-class population is dominated by non-Muslims. Among the top 50 richest Indonesians, only a few are Muslim (Forbes, 2017). This thesis cannot explain further about the disparity based on religion because it beyond the scope of this thesis and there are no previous studies comparing child poverty according to religion in Indonesia. Therefore, the religion disparity should be investigated further; it is not simple to compare child poverty rates based on religion with so many underlying factors at play, for example, location, migration, and ethnicity.
- Initial findings from absolute and relative deprivation showed higher proportions of deprived children from households whose heads have paid employment than from households with an unemployed head. This finding is in contrast to what is expected from monetary measures of poverty.

Namely, we expected heads of household who do not have paid work to have lower income and expenditure compared to the households that have paid work. However, when investigated further with logistic regression controlling other variables, it was confirmed that there is no relationship between deprivation and occupation of heads of household. Further investigation revealed that 53% of those households have other family members who have paid employment and, consistent with Bima and Marlina (2017), child poverty rates are lower for households with a larger numbers of working adults. This suggests that occupational status of head of household is not useful for identifying children likely to be poor, though identifying households with fewer working adults is likely to be important.

- All measures indicated that there are no significant differences between male and female children or between male and female household heads for absolute and relative deprivation. When investigating disparities in deprivation in greater detail, disparities between male and female children do exist in domains that cover individual-level indicators. However, disparities are not visible in household-level domains (such as in water and sanitation etc.). Conversely, when comparing disparities based on the sex of head of household, the disparities are found mostly at household-level domains. In using composite indices, these sex differences are no longer detectable. This suggests that composite indices are unable to detect the variations among domains. Although the use of composite indices such as absolute deprivation and relative deprivation analysis provide clear benefits to simplify the measurement of multidimensional child poverty, detail of information about the different experiences of poverty are lost.
- Children in households with fewer assets have a higher level of deprivation and monetary poverty. This is consistent with other studies (SMERU, 2011; UNICEF, 2017a).
- All measures show that children who are living in rural areas have a higher level of deprivation, which is consistent with the findings of other studies (BPS, 2017a; SMERU, 2011; UNICEF, 2017a).

- Children who are living outside of Java have a higher level of child poverty rates, which is consistent with other studies (BPS, 2017a; UNICEF, 2017a).

9.1.2.3 How sensitive are the thresholds of each method?

Sensitivity analyses indicate that many non-poor children are at risk of being poor. When the threshold changes, the poverty status of many children changes as well. When monetary child poverty thresholds are doubled, there are significant increases in child poverty. When the BPS absolute poverty line doubled, child poverty rates according to per capita expenditure increased from 11.57 to 44.08%, and child poverty rates according to equivalised expenditure increased from 10.43 to 41.24%. When the relative poverty line doubled, child poverty rates according to the national median increased from 33.33 to 70.79% while child poverty rates according to the provincial median increased from 29.53 to 69.8%.

The sensitivity of deprivation has the opposite direction compared to monetary child poverty (MCP). A higher deprivation threshold would mean a lower level of child poverty rates because the indicators of deprivation are interpreted differently. A high deprivation means experiencing many deprivations, and a higher threshold would only cover children who are deprived according to the particular threshold level. For example, based on the absolute deprivation measure, 47.61% of children were deprived according to a one-indicator threshold (deprived in at least one indicator), but this drops to 17.3% when using a two-indicator threshold (deprived of two indicators or more).

In addition to testing the additivity of the deprivation items, the confidence interval graphs in Chapter 6 subsection 6.1.2 and Chapter 7 subsection 7.1.2.1 show that when income, expenditure, or assets of households drop, children have an increased risk of more deprivation.

Considering the sensitivity of the thresholds, identification of thresholds was a crucial step. Poverty analyses performed here show that the selection of thresholds has a significant influence on the poverty headcount. The official thresholds are a reflection of how to define poverty and of the acceptable levels of poverty in the regulations and policy. An official threshold for Indonesia is only available for a monetary measure. Therefore, ANOVA and logistic regression

were used to select the optimum thresholds for absolute deprivation and relative deprivation (Guio et al., 2012; 2018; 2017; 2016).

9.1.3 How do these different methods characterise child poverty in Indonesia?

The comparison of different methods characterised child poverty by indicating children who are included and excluded in each method. The comparison also provided evidence children who face experience simultaneous experience of child poverty. Furthermore, the comparison would help to indicate the superior child poverty measure for particular contexts of Indonesia.

9.1.3.1 Which Children are Included or Excluded in Each Method?

The inclusion of children in each poverty measure is considered here by looking at the overlap between measures (children for whom different measures agree) and discrepancies (children are included in some but excluded by other measures of poverty).

In general, lack of agreement between monetary and non-monetary measures is consistent with the previous studies (Roelen, 2017; Roelen et al., 2012) that argue those measures inform child poverty differently. The monetary measure analyses child poverty indirectly, and monetary poverty does not always translate to non-monetary aspects of poverty such as deprivation (Coudouel et al., 2002; Gordon and Nandy, 2012; Ringen, 1987; 1988; Roelen, 2010; 2017; Roelen et al., 2012; Sumarto et al., 2007). However, multidimensional poverty provided comprehensive pictures of child poverty in Indonesia (Bima and Marlina, 2017; SMERU, 2011; UNICEF, 2017a). Multidimensional poverty not only provided more direct measures of child poverty compared to a monetary measure but also provided supporting evidence for how global perspectives of child poverty, using a human rights-based approach, were compared to child poverty measures that were developed based on public views.

Put simply, although there is some overlap among them, most children who are poor according to those measures are not necessarily the same individuals. The overlaps indicated simultaneous experiences of poverty. Referring to Bradshaw and Finch (2003), children who are poor by multiple indicators have a more

severe experience of poverty compared to children who are only poor according to a single measure.

9.1.3.2 To What Extent Do Poor Children Experience Different Types of Poverty Simultaneously?

The overlaps among the measures identify children who experience different types of poverty simultaneously. However, in this thesis, the overlaps among the three observed measures are small (about 3.86% of all children or 11.36% of children who are poor in at least one measure). This means the proportion of children who suffer from three different types of poverty simultaneously is small.

The main reason for small overlaps among the three measures is small relationships between monetary measures and absolute deprivation (about 4.26% of all children or 12.54% of children who are poor in one measure). The differences are expected because the monetary measure and absolute deprivation have different sets of indicators.

Additionally, small overlaps between monetary and absolute deprivation may be caused by differences in the identification of the threshold. The threshold of monetary poverty is identified based on the basic needs, while the threshold of absolute deprivation is identified based on child rights. The small overlaps may indicate that the concepts of basic needs may not be the same as the concepts of child rights, or that the concept of basic needs does not adequately acknowledge the special needs of children.

Although the overlaps among the measures are statistically small, they are considered significant in number. Based on the estimated child population data (Kementerian Pemberdayaan Perempuan dan Perlindungan Anak, 2018), it can be estimated that in 2017, about 3.2 million children experienced monetary poverty and also absolute and relative deprivation simultaneously. In addition, more than 10.9 million children experienced both absolute and relative deprivation, about 3.6 million children experienced both monetary poverty and absolute deprivation, and more than 5 million children experienced both monetary poverty and relative deprivation.

The proportion of children who experienced overlaps of poverty was higher in rural areas and outside Java, which is consistent with other research that has studied children in rural and remote areas (Bima and Marlina, 2017; Roelen, 2017; Roelen et al., 2012; UNICEF, 2017a) and children outside Java (UNICEF, 2017a). These other studies have found that children in rural and remote areas outside Java experience higher rates of poverty and are poor in more ways, experiencing various types of poverty. Children in rural areas and outside Java also experience higher numbers of deprivation and higher intensity of deprivation as well as poverty gaps.

9.1.3.3 Which is the Best Approach to Measuring Child Poverty in Indonesia, and Why?

In general, there is no best child poverty measure. As noted here, there is also no agreement on the methodology to investigate what the best child poverty measures are. However, the comparison of results and assessment of the sensitivity, specificity, and predictive value of measures suggests that multidimensional measures are preferred because they measure child poverty directly and provide more accurate estimates of child poverty.

Various methodologies were applied to analyse and diagnose the accuracy of different child poverty measures. The sensitivity, specificity, and predictive values of the measures were applied to investigate the accuracy of the measures. Additionally, receiver operating characteristic (ROC) curves were used to support the discussion on sensitivity, specificity, and predictive values.

The results confirmed that there is no universally best method to measure poverty since the estimates to identify the best measure do not always provide consistent results. On many occasions, they show contesting results.

- Among monetary measures, absolute poverty is a better measure than relative poverty because it allows the comparison among provinces and also acknowledges the variations among regions. In comparison, relative poverty based on the provincial median did not allow comparison among provinces while relative poverty based on the national median did not acknowledge variations among provinces.

- By comparing two multidimensional non-monetary measures, the reliability test shows that absolute deprivation has lower internal consistency (alpha and omega scores are 0.37 and 0.41 respectively) compared to relative deprivation (alpha and omega scores are 0.73 and 0.75 respectively). However, relative deprivation excluded most child-level indicators from estimation while the set of indicators of absolute deprivation are more comprehensive. Therefore, the set of relative deprivation indicators are less sensitive for capturing individual variation among children compared to absolute deprivation.
- The accuracy of the measures was also contested. Absolute deprivation has high scores of sensitivity, specificity, and predictive values. However, relative deprivation has the best scores in sensitivity and negative predictive values. The only agreement in the ROC analysis is that monetary measures have the smallest ROC area compared to absolute and relative deprivation. It is likely that relative deprivation has a more valid and reliable set of indicators which leads to a better composite score of the number of deprivations. However, absolute deprivation has a better threshold to identify poor children from the perspective of ROC analysis.

The diagnostic test also revealed that methods work better in some conditions than others. The ROC analysis showed that relative deprivation provides more accurate estimates of child poverty in more developed areas such as Java and urban areas, while absolute deprivation is more accurate in the least developed areas (rural and outside Java). In urban areas and Java, people are likely to have better access to public services and tend to be wealthier. Measuring child poverty using absolute deprivation in the urban areas and Java becomes less relevant because in some domains, deprivations are few. Also, the deprivations in those domains are not necessarily caused by lack of resources. Furthermore, in the more developed areas, the necessities are more complex and no longer focused on basic needs. While measuring absolute deprivation is crucial, relative deprivation analysis is required to gain a broader representation of child poverty.

The findings indicated that the role of relative deprivation increases in more developed regions, which is supported by the current practices of using relative deprivation in rich countries while absolute deprivation is more popular in

developing countries. While the application of relative deprivation analysis in rich countries provides a specific set of indicators (Guio et al., 2012; 2018; 2017; 2016; Main, 2013; Main and Bradshaw, 2014), the application of relative deprivation in developing countries (Nandy and Pomati, 2015) provides a similar set of indicators to absolute deprivation (Nandy, 2012).

9.2 Contributions, Strengths, and Limitations of this Research

Through comparing the conceptual and empirical differences in child poverty measures in Indonesia, this thesis provides scientific contributions toward a more profound understanding of sensible ways to assess and operationalise child poverty measures in Indonesia and contributes to discussions about how child poverty should be conceptualised and measured. Through comparing child poverty from theoretical and empirical perspectives, three different child poverty measures for the same population were used.

This thesis contributes to the discussion of the strategy used to select indicators and thresholds of child poverty measures in Indonesian contexts. For example, the work here broadens the scope of child poverty measures in Indonesia through investigating relative deprivation. Relative deprivation measures were created by drawing on findings from local studies including qualitative studies, which is a significant contribution to the field. Although this process does not allow for indicators identified as socially perceived necessities, it marks a step forward in efforts to reflect local understandings of necessities and acknowledge people's views on child poverty. Furthermore, this work represents a pioneering study on relative deprivation among children in Indonesia and provides ideas for further studies.

This thesis expanded the scope of previous studies in Indonesia. Previous studies (Bima and Marlina, 2017; BPS, 2017a; Hadiwidjaja et al., 2013; Landiyanto, 2013; SMERU, 2011; UNICEF, 2017a; World Bank, 2015c) focused on the empirical comparison of child poverty rates with limited evaluation of the strengths and limitations of the child poverty measures in Indonesian contexts.

Additionally, this thesis is one of the pioneers of the comparative studies of diagnostic accuracy of child poverty measures. The aim here is to provide an

alternative strategy for evaluating child poverty measures through the application of sensitivity, specificity, and receiver operating characteristics (ROC) curve analysis. The use of these methods helped to identify appropriate measures based on the geographical situation in Indonesia that is useful for policy making.

Empirically, poverty rates were estimated according to different child poverty measures considering individual, household, and geographic characteristics using data that cover various parts of Indonesia. Contributions are made to a discussion of the degree of overlap between child poverty measures in Indonesia. In a practical sense, the overlaps indicated whether the different measurement methods are, to some extent, interchangeable.

In terms of social policy, evidence for the strengths and weaknesses of different child poverty measures is provided and will be useful in selecting appropriate child poverty measures for the Indonesian context. The findings presented here also contribute evidence to support policy making to deal with child poverty and to accelerate the realisation of child rights. Additionally, this work is a potential contribution to strengthening quantitative surveys through identifying the child poverty domains and indicators in the local context. Furthermore, this work provides a lesson learned on child poverty measurement that is invaluable in strengthening Indonesian child poverty monitoring, improving statistical records, and providing a benchmark for child poverty measurement standards in Indonesia.

However, despite its contribution, the limitations of this research must be acknowledged. The main limitation of this thesis is that the methods cannot fully unpack the nature of child poverty in Indonesia. When investigating the nature of child poverty, the thesis is only able to cover subgroup disparities and overlaps among child poverty measures and also conduct some reflection and evaluation on the child poverty measures. There are many remaining aspects of child poverty measures that have not been covered and are worth to be investigating in further research.

Data limitation is a significant issue. Due to data limitation, this thesis was not able to analyse relative deprivation based on socially perceived necessities. The indicators could not be selected based on socially perceived necessities, only

based on previous studies. Additionally, some domains considered necessities could not be included in the analysis because the data did not support them, for example social interaction with friends. However, as mentioned in the introduction, the aim was not to develop the best or perfect measure of relative deprivation. Instead, the goal was to develop a good enough measure that can be applied to investigate relative deprivation in the Indonesian contexts. Further investigation of the contextual aspects of child poverty in Indonesia, for example, investigating socially perceived necessities is important. Further investigation to understand whether the application of socially perceived necessities in the relative deprivation measure is than the current application of the relative deprivation measure used here in terms of reliability and validity is also important. This determines whether relative deprivation measures are better than absolute deprivation and monetary measures.

Another limitation is the lack of previous studies of sensitivity, specificity, and ROC analysis to evaluate poverty measures. There is no adequate reference to understand whether the analysis was conducted properly and whether the approach is legitimate for poverty studies. Some of the results are valid only under certain assumptions. For example, the analysis of sensitivity and specificity were conducted with the assumption that latent class analysis can provide a 'good' reference standard. To what extent this assumption is realistic was not tested empirically, especially in the context of child poverty.

Despite the limitations, the research questions were answered, and it was confirmed that different measures inform child poverty differently.

9.3 Implications for Research

9.3.1 Potential of Diagnostic Tests

Diagnostic tests such as sensitivity and specificity analysis have the potential to be used in child poverty studies. The tests help to provide insight into the accuracy of the measures against reference standards. However, the main issue to be tackled for diagnostic tests of poverty measures is the identification of the reference standard because a 'true' measure of poverty (a gold standard test) does not exist.

Furthermore, this research found that the diagnostic tests did not always provide a clear indication of the best measure because the results were ambiguous. Therefore, the identification of the best child poverty measures cannot rely exclusively on the methodological aspect. Other aspects such as the use of information and the consistency with regulation and policy must also be considered.

9.3.2 Geographic Based Child Poverty Measures

There are needs for different methods of measurement in different localities. The diagnostic tests informed that relative deprivation is more appropriate for estimating child poverty in more developed areas such as Java and urban areas, while absolute deprivation is more appropriate in the least developed areas like rural areas and outside Java.

9.3.3 Appropriateness of the Child Poverty Measures

A measure can be considered as appropriate when it fits the needed information and any existing regulations and policies. The appropriateness can be used as a pragmatic justification for selecting the best measures. The measures can be considered as appropriate for the needs for information when they can provide the information required for policy making and evaluation. This aspect is related to how child poverty measures align with any specific policy or regulation such as the national child protection law (GOI, 2002b; 2014) or laws and policies for poverty reduction (GOI, 2010; 2011).

However, when the selection of child poverty measures depends on regulations, they are no longer objective, because the decision to regulate child poverty measures brings child poverty discourses into a political process. In this situation, there are some benefits and disadvantages. As a benefit, the government may pay more attention to child poverty and may provide more support for data collection. However, there is a risk that the data become part of the politically machinery. The danger is that data are no longer independent, and their accuracy might be compromised, especially when the strategy to develop and integrate child poverty measures based on regulations does not meet academic standards.

Therefore, it should be decided whether child poverty research should align with policies or be independent. To align with policies means that the measure will

have some relationship to social policy. The measure then enters the domain where the focus becomes national social policy and provides data that supports social policy. However, independent research has more freedom, but the results would not necessarily support social policy.

9.3.4 Consequences of the Selection of Indicators

The selection of indicators has some consequences. Although relative deprivation has fewer indicators than absolute deprivation, by design, absolute deprivation covers a wider range of the UN Convention on the Rights of the Child (UNCRC) domains (Gordon et al., 2003; Pemberton et al., 2007) compared to relative deprivation which is not necessarily developed based on any specific legal framework like UNCRC (Barnes and Wright, 2012; Guio et al., 2012; 2018; 2017; 2016; Main, 2013; Main and Bradshaw, 2014; Nandy and Pomati, 2015).

However, the evaluation of the reliability and validity of absolute deprivation measures inform low internal consistencies and some items such as health and food are not valid. These findings call into question the usefulness of absolute deprivation in the Indonesian context. Since the criterion for validity tests are resources (expenditure, assets, and income), the validity issues on health and food domains indicated that lack of resources did not necessarily cause deprivations of food and health. When we stick to the definition of poverty as the lack of resources, children who are experiencing absolute deprivation cannot always be claimed to be poor. This indicates a contradiction of the main consideration for selecting items; internal consistency of the concepts behind the selection of items. Applying the full set of absolute deprivation items means that the absolute deprivation measure in Indonesia will not be valid and reliable. However, since the intention was to analyse absolute deprivation based on the existing measures, all of the items in the existing absolute deprivation measure were included in the analysis. The current set of items in the measure covers the important domains of UNCRC and Indonesian child protection law. Also, since the measure is already used in other countries (Alkire and Roche, 2012; Gordon et al., 2012; Gordon and Nandy, 2012; Gordon et al., 2003; Minujin et al., 2011; Minujin and Delamonica, 2012; Nandy, 2012), the application of the absolute deprivation measures provides comparable estimates.

However, one of the common strategies for relative deprivation measures is identification of necessities in the observed society, commonly based on people's views on the identification of indicators, and those views are not necessarily in line with UNCRC (Barnes and Wright, 2012; Guio et al., 2012; 2018; 2017; 2016; Main, 2013; Main and Bradshaw, 2014; Nandy and Pomati, 2015). Additionally, since the indicators used for relative deprivation depend on reliability and validity tests, the indicators that are considered important from the perspective of UNCRC do not always pass the tests.

In this case, the statistical findings from the selection of indicators are not necessarily aligned with the regulations and the priority of public policy. For example, during the process of selection of relative deprivation indicators, it was found that health indicators were not reliable and valid. Therefore, those indicators were removed from the final set of relative deprivation indicators. However, health for children is one of the priorities of social policy in Indonesia (SMERU, 2011; Sparrow, 2006; UNDP, 2015) and also an important element of child rights according to Indonesian child protection law (GOI, 2002b; 2014). Removing health indicators would means that the relative deprivation measure cannot capture one of the essential domains.

9.3.5 Data for further child poverty research

For further research, there are two possible methods for measuring child poverty in Indonesia: secondary analysis of existing data such as the National Socioeconomic Survey (SUSENAS) (BPS, 2015b) and the Indonesian Family Life Survey (IFLS) (Sikoki et al., 2013; Strauss et al., 2016a; b), and the collection and analysis of new primary data collected for the purpose of assessing child poverty. New primary research would be the best fit because it would be designed to align with the measures. However, a representative survey is expensive and special data for child poverty measures do not exist, especially at the national level. Therefore, the compatibility of the measure with the regularly collected data, such as SUSENAS, is a plus. The main issues are whether the data are available and regularly updated and whether the measure is compatible with existing data such as SUSENAS. Interestingly, SUSENAS also aligns with the final list of indicators of relative deprivation. However, there are many improvements required to allow SUSENAS to perform better in the analysis of relative

deprivation. Improving the availability and coverage of the data to support further analysis of child poverty is recommended. For example, adding information about socially perceived necessities to the Indonesian Family Life Survey (IFLS) or National Socio-economic Survey (SUSENAS) data. Additionally, mixed methods provide a more in-depth analysis. For example, a qualitative investigation to identify the domains of relative deprivation in the absence of socially perceived necessities data.

9.4 Policy Implications

The definition and measures of child poverty and identification of the thresholds has strong implications for social policy in Indonesia. The definition and measures of child poverty are the basis for determining the target groups for social policies, estimates of the number of poor children, and the identification of children who get the social benefits. However, there is room to improve the understanding of the meaning of child poverty in Indonesian policy and legislation.

9.4.1 Identifying and Supporting the Poorest Children

Disparity in rates of poverty indicates inequality among groups of children and reflects various social problems (Bima et al., 2017; ISAE and UNICEF, 2009; REPOA and UNICEF, 2009; SMERU, 2011; UNICEF, 2009a; n.d; n.d.). As noted previously, generic intervention to all poor children may not be adequate, because disadvantaged subgroups have factors that make them at higher risk for experiencing child poverty. Therefore, intervention to deal with child poverty should acknowledge the disparity.

In general, the analysis of the disparity provides general insights about children who are more likely to be poor in Indonesian society, as follows.

- Having poorly educated parents or guardians
- Have fewer assets
- Living outside Java
- Living in rural area

Therefore, any intervention to deal with child poverty should acknowledge those characteristics. For example, the scale of the response should be different for

children who meet all the characteristics above because they are more likely experience child poverty (and also have a higher likelihood to experience more types of child poverty simultaneously) and need more intensive response.

Additionally, there is a need for different methods of measurement in different localities (i.e. urban vs. rural) considering the results of the sensitivity, specificity, and receiver operating curve (ROC) analyses. Those differences should be considered when identifying the children who should get poverty reduction and social protection support.

9.4.2 Institutionalisation of Child Poverty Measures

No single measure will identify all children. Policy makers should attend to the different ways of measuring poverty and consider which is appropriate for their needs. The government of Indonesia should acknowledge the differences in the needs and develop national standards for defining and measuring child poverty. The standards would provide a guideline by which to implement child poverty measures and identify poor children who fit with the policy objective to eradicate child poverty.

Therefore, to institutionalise the measurement of child poverty in Indonesia, child poverty measures should be in line with the policy and regulation related to poverty and children. The problem is the definition of poverty and children in Indonesian legislation and policy frameworks are not consistent and contrast with each other. For example, there are inconsistent age thresholds for children between regulation and policies and also inconsistencies among the definition and measurement of poverty in regulation.

9.4.3 Policy Implication of the Thresholds

To develop the standard, the selection of the child poverty thresholds is one of the crucial areas needing attention. The selection of thresholds is not only a methodological issue and a critical aspect of the measures, but also has strong policy implications. The thresholds influence the estimated number of poor children. When the thresholds are too low, more children will be considered poor and require social assistance and vice versa. Therefore, the selection of the threshold influences the estimates of the required budget for poverty reduction.

The more children who are considered as poor, the higher the budget required for poverty reduction.

However, in practice, the situation can be the opposite, in which the threshold does not influence the budget, but the budget allocation influences the threshold. The number of recipients of the support depends on the available budget.

Under this situation, the use of ranking commonly happens in social protection programs that identify thresholds based on how many target beneficiaries can be covered by the budget. In this case, rather than identify the poor households, the measure was applied to rank the poor households based on poverty indicators or indices.

However, the number of poor children identified based on household poverty may differ from the number of poor children based on child poverty.

To deal with this situation, it is recommended that children be ranked based on the child poverty index. The poor children who get child targeted social protection support would be determined based on the child poverty ranking and the number of children who can be covered.

9.4.4 Individual versus Household Indicators of Child Poverty

The different measures of poverty include different household and individual indicators of poverty. Monetary child poverty (MCP) uses only household indicators. These monetary measures are only able to locate poor children who are living in monetarily poor households. However, absolute (AD) and relative deprivation (RD) also cover child specific indicators (for example, AD covers information, health, and nutrition). Therefore, AD and RD allow detection of poor children who are living in non- monetarily poor households.

From the policy perspective, identification of poor children based on household poverty is not wise strategy because would exclude poor children from non-poor households. Therefore, interventions aimed at helping poor children supposed to use different estimates than interventions targeting poor households. At some level, this strategy has been implemented. For example, poor households would receive family welfare cards (KKS) (TNP2K, 2017). Subject of meeting one of the criteria (There are under 5 children, school age children who are not enrol to

school, pregnant women or postnatal women in the households), the KPS recipient would receive the support of family hope program (PKH). On the other hand, government of Indonesia implement scholarships for the poor children (*Bantuan Siswa Miskin* [BSM]) and the Indonesian smart-card (*Kartu Indonesia pintar* [KIP]) to support poor students (Suryahadi and Al Izzati, 2018). The targeting approach for scholarships for the poor children and the Indonesian smart-card tried incorporated awareness of the issue of mismatch between household poverty and individual level deprivation. The general mechanism to identify the recipient of the scholarships and the smart-cards is using the households' ownerships of family welfare cards (KKS) or participation in family hope programme (PHK) as a means for verification. The smart-cards, for instance, are provided to children from poor families who are currently attending school (Kementerian Pendidikan dan Kebudayaan and Kementerian Agama, n.d). This means that children from a household that does not receive KKS may be excluded from target of recipient of KIP. Therefore, child-specific mechanisms for verification were expanded to include orphans, victims of disasters, disabled children, children participating in non-formal education, students in grade 6, grade 9, grade 12, and grade 13, and students of vocational education. Poor children who meet those criteria can request scholarships for the poor and an Indonesian smart card (Kementerian Pendidikan dan Kebudayaan, 2017).

9.4.5 Acknowledging Simultaneous Experiences of Child Poverty

The social policy needs to pay particular attention to children who experience different types of poverty simultaneously. The overlaps among measures, although small, should be considered. The overlaps indicate the poorest children among the poor, and these children may need more intensive intervention. The small overlaps among the measures also indicate that the measures cannot replace each other. When selecting one measure for the research, it should be acknowledged that children who are poor according to other measures may not be covered. When the measures are used for selecting the intervention, only children that fit with the measure that will receive support. Social policy intervention that targets the poor children who are identified by one measure may exclude children who are poor according to other measures. The situation could be worse since the government does not use any child poverty measures for

targeting. Instead, it uses household-based poverty to identify the poor (Bah, 2014; Bah et al., 2014; TNP2K, 2012; 2014; 2017). Therefore, the key policy issue in this context is the identification of criteria to select the appropriate child measure. In practice, the mechanism to select the poor in the Indonesian unified database for social protection (TNP2K, 2017) should be improved to acknowledge child poverty in more effective ways. For example, this data should be able to detect poor children from non-poor households. Additionally, the database should be able to detect children who experience multiple types of poverty, because they are suffering more than others and should become the target of specific intervention.

9.5 Conclusion

The selection of poverty measures has strong policy implications. Choosing child poverty measures means choosing which children are identified as poor (or not poor) and hence eligible for support (or not).

As discussed previously, there is a lack of evidence on child poverty measures in Indonesia not only in terms of how the different child poverty measures currently employed compare but also in terms of how other measures can provide alternative insights to explain the extent and nature of child poverty. Therefore, this thesis has made a scientific contribution through investigating whether different child poverty measures indicate the extent and nature of child poverty differently.

Exploring sensible ways to assess child poverty is not adequate to understand the best child poverty approach in the Indonesian context. Child poverty is a multifaceted concept. There is no single definition of child poverty. The definition of child poverty is affected by how children are defined and also by how poverty is defined. While there are many ways to measure child poverty, each measure has strengths and weaknesses. Therefore, there is no such thing as a universally superior child poverty measure.

However, the study found that the multidimensional approach (absolute and relative deprivation) was preferred above the monetary approach. Although there

are no strong conclusive results, relative deprivation slightly outperformed absolute deprivation, especially in the urban areas and in Java.

The estimation of the child poverty rates revealed the extent of child poverty and showed that relative deprivation indicates the highest child poverty rates, and monetary poverty indicates the lowest poverty rates. However, comparison of child poverty rates does not adequately unpack the nature of child poverty. Further investigation is required.

The nature of child poverty was investigated by comparing child poverty rates based on individual, household, and geographic subgroups as well as investigating the overlaps among child poverty measures. The comparison of different child poverty measures based on subgroups and the small overlaps among those measures confirm that different child poverty measures indicate the extent and nature of child poverty differently. However, it needs to be acknowledged that children who face overlaps are the poorest among the poor.

Appendix A. Comparison of Approaches to Child Poverty Assessment

Table A-1. Comparison of per capita, child cost and equivalence scales in assessment of monetary poverty

	Meaning and Assumption	Advantages	Limitation
Per capita Approach	Per capita approach measures poverty by dividing households' consumption with a total number of household members. This approach assumes that consumer goods and services are equally shared among household members. Those children are assumed that they will not be able to have their basic needs met because their parent(s) do not have financial resources (White and Masset, 2002).	Per capita approach is simplest to calculate and compare.	Some studies (For example: Main, 2013; Roelen, 2010; Roelen and Gassman, 2008) find that some children who are considered as non-poor from monetary perspective, may be poor in non-monetary terms and vice versa. In addition to the argument about the supply of goods and services discussed above, the discrepancy between monetary and non-monetary poverty among children means that monetary resources of parent(s) do not always lead to improved well-being for children. It is supported by evidence from Cockburn et al. (2009) who argues for the importance of considering intra-households allocation due to the discrepancy of between household and individual level poverty (adults and children) from the nutrition intake-perspectives. Therefore, this thesis argues that intra-household allocation of resources and the consumption pattern can help explain the discrepancy concerned. Indeed, it is probable that poor families/households make a greater investment in their children than non-poor families/households. This poses a problem because consumption needs of children and adult tend to differ. Children are likely to consume less than adults. The consumption needs of children can also vary according to their age and gender. Therefore, per capita

	Meaning and Assumption	Advantages	Limitation
			approaches may not provide an appropriate measure of child poverty because they fail to capture the special characteristics of children in term of consumption.
Child Cost	The child cost calculates the household expenditure in greater detail compared to per capita approach. It distinguishes between the goods and services consumed by adults and children and then summing up all household cost that related to children then assign to children with the per capita household cost of public good and non-public good that are consumed together by the family (White and Masset, 2002).	More accurate than per capita approaches because it recognises the differences between adults and children.	Needs more detailed expenditure data. Additionally, while it focuses on real expenditure, it does not recognise different gender and household size and composition.
Equivalence Scales	The equivalence scale approach can take into account the variation in the consumption needs due to age and gender. Equivalence Scales is a standard that recognizes the difference between age and sex and the incremental cost of additional household members. This scale uses the adult equivalence to measure the cost of the children. To illustrate, if an adult receives an equivalency score of one, children are then given 0.4 of the adult equivalence score. The equivalence score for a household with two adults and three children is 3.2, which means that each child consumes 12%, and each adult consumes 29% of total household's consumption. The scores are usually more complex than the illustration above because the adult equivalence of adult and children will differ	Acknowledge households' size and composition.	There is no standard for equivalence scale. Needs more detailed expenditure data for calculating. OECD (2009) proposes some generic equivalence scales for adult and children, taking into account the household size but whether these, will apply to Indonesian contexts remains an open question given the possibility that the consumption pattern in OECD member countries.

	Meaning and Assumption	Advantages	Limitation
	according to age, gender and household size (White and Masset, 2002).		

Table A-2. Comparison of multidimensional child poverty measures

Approaches and Authors	Domains	Strengths	Limitation
Bristol Method (Gordon et al., 2012; Gordon and Nandy, 2012; Gordon et al., 2003; Minujin and Delamonica, 2012; Nandy, 2012)	The Bristol Method is a method to measure absolute deprivation among children. It is developed based human rights perspectives and covers eight domains of deprivation: • Severe food deprivation: Children experienced severe food deprivation when their heights and weights for their age were more than –three standard deviations below the median of the international reference of the population. It also can be called as severe anthropometric deprivation (Gordon and Nandy, 2012; Gordon et al., 2003). Children in such situation can be considered as malnourish. • Severe Water Deprivation: Children experienced severe water deprivation when they only had access to surface water (e.g. pond, rivers) for drinking or who lived in households where the nearest source of water was more than 15 minutes away (Gordon and Nandy, 2012; Gordon et al., 2003). • Deprivation of Sanitation Facilities: Children experienced severe deprivation in sanitation facilities when they had no access to a toilet of any kind in the vicinity of their dwelling. For example, there is no private or communal toilets or latrines near their house (Gordon and Nandy, 2012; Gordon et al., 2003). • Severe Health Deprivation: Children are considered to experience severe health deprivation when they had not been immunised against any diseases. They also considered being deprived when they, especially young children, had a recent illness involving diarrhoea and had not received any medical advice or	Bristol method considers that children are different to adult and have special needs for protection, survival and development (De Neubourg et al., 2014; De Neubourg et al., 2012a; b; Delamonica et al., 2006; Gordon et al., 2003; Pemberton et al., 2012) It has successfully aligned child poverty measurement and UNCRC (Alkire and Roche, 2012; Gordon and Nandy, 2012) Additionally, because it uses multiple indicators cluster surveys (MICS) and Demographic and health survey (DHS), Bristol method is very suitable to monitor the fulfilment child rights and can be replicated in many	Bristol method pays to many focuses focus on material deprivation and excluding social deprivation and psychological deprivation. However, it may be caused by lack of the available data as a common constraint of child poverty studies in developing countries (Jones and Sumner, 2011).

Approaches and Authors	Domains	Strengths	Limitation
	treatment (Gordon and Nandy, 2012; Gordon et al., 2003). • Severe Shelter Deprivation: Children experienced sever shelter deprivation when they are living in severe overcrowding dwellings with more than five people per room or living in shelters with inadequate materials, for example, with no flooring material (e.g. a mud floor) (Gordon and Nandy, 2012; Gordon et al., 2003). • Severe Education Deprivation: children experienced severe education deprivation when they aged between 7 and 18, but they had never been to school and were not currently attending school (Gordon and Nandy, 2012; Gordon et al., 2003). • Severe Information Deprivation: children experience severe education deprivation when they aged between 3 and 18 but without access to, radio, television, telephone or newspapers at home (Gordon and Nandy, 2012; Gordon et al., 2003).	countries (Alkire and Roche, 2012).	
Qi and Wu (2014)	Qi and Wu (2014) measure child poverty based on absolute deprivation lenses. The domains and indicators are identified based on human rights framework. The domains are as follow: • Food/ Nutrition • Water • Sanitation Facilities • Shelter • Education • Health • Information • Consumer Durables • Leisure	This thesis provides interesting ways for justifying the selection of Indicators. After the indicators are selected based on theory and previous studies, they conduct validity, reliability and additivity to test the selected indicators.	This thesis focuses more on absolute child poverty and deprivation. It did not adequately acknowledge the relative aspects of child poverty.

Approaches and Authors	Domains	Strengths	Limitation
DEV Framework (Wordsworth et al., 2005)	The DEV framework introduced by CCF (Christian Children Fund) and composed three dimensions (Wordsworth et al., 2005) as follow: • Deprivation: According to Wordsworth et al. (2005), deprivation looks at the severity, intensity and contextualised nature of children's experiences of the deficit about their material condition and access to basic services. Severity explains the condition when their experiences of deprivation are to such degree that is threatening their lives or significantly threatening their physical or psychological well-being. Intensity explains the condition when those children are facing multiple deprivations at one time. Context explains the condition when those the experienced deprivation is a consequence of local value/ context. All of the elements of severity, intensity and context are important to understand the impact of deprivation on children's life • Exclusion: it looks at the process of individual or groups of children are marginalised from full participation in the society where they live. Wordsworth et al. (2005) perceived that exclusion is different to deprivation in the context of the focus. Deprivation focus on lack of necessities and exclusion focus on the process that contribute to the lack. • Vulnerability: It looks at the dynamic nature of children experience in poverty in term how they affected or resilient to the change of condition (Wordsworth et al., 2005) The main idea of the DEV framework is to demonstrate how each of those dimensions will be able to capture the complexity of life of poor children (Wordsworth et al., 2005).	DEV framework put a lot of attention on vulnerabilities. Additionally, the information collected based on qualitative methods, to get children experiences, occasionally compared related to adult experiences, it means the DEV framework integrates subjective perspective into all of the dimensions.	DEV framework is difficult to operationalise in a quantitative manner because it is mainly designed for qualitative research.

Approaches and Authors	Domains	Strengths	Limitation
The basic framework Young lives multidimensional poverty Young lives (2011)	Young Lives provides a general concept of child well-being that provides a comprehensive picture of child well-being. The proposed dimensions of the Young Lives Framework are as follows: • Nutritional status • Physical morbidity • Mental morbidity • Life skills (literacy, numeracy, work skills, etc.) • Developmental stage for age • Perceptions of well-being and life chances	The young live approach provides very holistic and inclusive methods, not only child poverty and well-being but also whole life cycle (Roelen and Gassman, 2008). Additionally, because it supported by longitudinal observation, Young Lives able to follow the changes of children well-being overtime (Delamonica et al., 2006).	The young live approach does not provide clear guideline to operationalise multidimensional child poverty measures. Additionally, because it covers many dimensions, it will need comprehensive data that are not necessarily available outside young lives project areas.
Trani et al. (2013)	Trani et al. (2013) identify the domains of absolute Deprivation based on the capability approach. • Health: Unlike other measures that are comprising wide aspects of health, the health domain of Trani et al. (2013) only covers access to safe water. • Care: This domain focus on mother care while lack of mother care considered as deprived. • Family Assets: This domain focusing on asset ownership. • Food Security: This domain is about the perception of food adequacy. • Social Inclusion: The social exclusion here is about ill-treated, participation ceremony and child marriage • Education: This domain focus on education access. • Freedom from Exploitation: This domain mainly discusses child labour. • Shelter and Environment: It focuses on overcrowding	This is an interesting effort for analysing child poverty using capability approach. It can be considered as more child focus if compared to Alkire and Foster (2011a) and also has wider domain comparing to Alkire and Roche (2012).	Trani et al. (2013) recognise the abstraction of the capability, and they select domains are mainly based on the functioning, not based on the capability. Additionally, although they have a long list of potential capability, they only able to select some indicators because of their dataset unable to capture the information of some necessities, for example,

Approaches and Authors	Domains	Strengths	Limitation
	• Personal Autonomy: Focusing on the ability to do basic activities such as bathing, getting dress, prepare meals and going to the toilet. • Mobility: focusing on the ability for mobility such as climbing stairs, going to the bazaar, carrying water, working in the field, riding a bicycle or animal.		they only select access to save water as indicators of health.
Roelen (2010)	Roelen (2010) uses basic needs to identify the non-monetary domains of child poverty. The domains are as follow: • Education: This domain mainly focuses on the access to education. • Housing: Focus on overcrowded • Labour • Water and Sanitation • Leisure: It is translated as having toys and books. • Social Inclusion and Protection: It is focusing on the ownership of birth certificates For the monetary child poverty, she uses expenditure as an indicator.	Roelen (2010) considers leisure as basic needs. It seems that she would like to cover beyond subsistence concept of needs.	The choices of indicators need to be justified. She uses a normative approach based on the theory and previous studies, but she does not test whether the indicators are valid and reliable.
Multiple Overlapping Deprivation (De Neubourg et al., 2014; De Neubourg et al., 2012a; b).	MODA is mainly covering non-monetary child poverty domains. However, it also incorporates monetary child poverty domains. Similar to Bristol Methods, it considers that children are different to adult and have special needs for protection, survival and development (De Neubourg et al., 2014; De Neubourg et al., 2012a; b). The non-monetary domains of MODA are identified based on UNCRC, which most of the domains are similar to Bristol methods, except, MODA also covering the domain of protection of violence which is excluded from Bristol Methods. The non-monetary domains of MODA are as follow. • Nutrition • Health • Education • Information	Since it is an adaptation of the Bristol method, share similar strengths as the Bristol Methods such as inline to UNCRC and also distinguish adult and children. However, MODA has advantages over Bristol methods though allowing the analysis of poverty	The MODA's indicators are only appropriate for developing country contexts. Additionally, MODA pays to many attentions in absolute child poverty through its standardised indicators and seems to ignore the relative aspect of poverty. The reliability and validity of the indicators are also not tested.

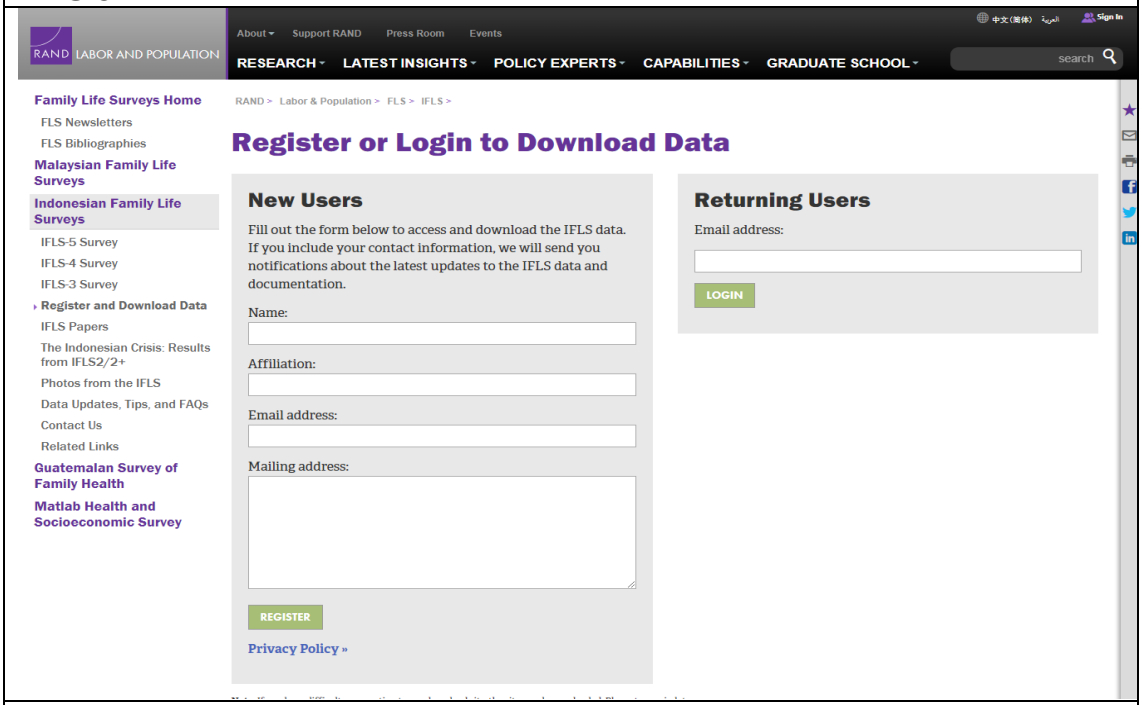
Approaches and Authors	Domains	Strengths	Limitation
	• Water • Sanitation • Housing • Protection from Violence On the contrary, the monetary domains of MODA mainly focus on household expenditure based on the absolute poverty threshold.	gap and also square poverty gap.	
Bristol Social Exclusion Matrix Levitas et al. (2007)	Levitas et al. (2007) Constructed the social exclusion matrix based on the three points of views: resources, participation and also Quality of Life. Resources: • Material/economic resources which mainly related to income, but also related to possession of necessities • Access to public and private services. These elements of social capital are important for both children and adults, but the importance may be differences, children may need access to special types of services, such as immunisation more than adults. • Social resources. Unlike social capital that focuses more on the perspectives of community, social resources focus more on the perspectives of individuals. Participation: • Economic participation mainly focuses on access to employment. This element is more important for adult and having indirect influences to children. • Social participation that including participation in social activities and also social roles.	Bristol Social exclusion matrix will provide comprehensive perspectives on the dimensions, domains and indicators of social exclusion. However, the scope of Bristol social exclusion matrix is beyond the participation in the society that gets less attention in the operationalising of absolute deprivation. The matrix also can be used to assess the availability of data to support analysis of social exclusion. When the government in developing countries would like to	Levitas et al. (2007) need to have more distinction between important elements of social exclusion for adult and children, because some elements of social exclusion may be more important for the specific ages, specific roles and specific gender. However, Oroyemi et al. (2009) provides more concrete practical application of Bristol social exclusion matrix Furthermore, because it is comprehensive and comprises many dimensions of social exclusion, the data to

Approaches and Authors	Domains	Strengths	Limitation
	• Culture, education, and skills. The cultural aspect of participation is covering cultural capital, which can be contributed to economic capital, and also cultural participation influenced by the cultural life. The cultural participation also related to the improving basic skills, education and access to information, because education itself is cultural participation, an element that is very important for children. • Political and civic participation which are not related to political activities such as participating in political votes or become members of political parties but also citizenship status, birth certificates and other entitlement of civic rights. Quality of life Health and well-being • Living environments that including housing, environment and neighbourhoods. • Crime, harm and criminalisation such us free from bullying, harassment and also criminalisation.	improve poverty statistics system to be friendlier to the analysis of social exclusion, the Bristol social exclusion matrix can be one of the very important references.	support the analysis not always available, especially in developing countries.
Yousefzadeh (2013)	Yousefzadeh (2013) construct multidimensional child poverty from three different concepts, basic needs, social exclusion and socio-economic construction of childhoods as follows: Yousefzadeh (2013) follow Roelen (2010) when using basic needs to identify the domain. However, Yousefzadeh (2013) excluded important domain related to health from her basic needs measure. However, She acknowledges its limitation and explains that it caused by the data limitation. Yousefzadeh (2013) also expand Roelen's (2010) domains of exclusion and protection as two separate concepts. However, she did not specify birth registration in the legal protection.	It is an interesting attempt to include socio-economic construction of childhoods as dimensions of child poverty. Additionally, it provides interesting overlap analysis between	The choices of indicators need to be justified because this thesis selects indicators based on a normative lens from theory and previous studies. This thesis also simplifies the meaning of leisure

Approaches and Authors	Domains	Strengths	Limitation
	The domains proposed by Yousefzadeh (2013) can be seen as follow: Basic Needs • Education: It focuses on the access to education. • Housing: Focus on overcrowded • Labour • Water and Sanitation • Leisure • Information Social Exclusion • Parent Literacy and Employment. It is about living with illiterate family. • Household Income Poverty: Although it mentioned as income, actually, it means poverty based on household expenditure. • Access to Means Mobility that means that the households without transport • Access to Reliable Sources of Energy • Family Structure with focus on living in lone parent Socio-Economic construction of Childhoods • Child Marriage • Legal Protection	exclusion and unmet of basic needs.	which needs to be explored more. Furthermore, this thesis identifies different levels of thresholds for each indicator by deprived, moderately deprived, however, the thresholds seem to need to be justified more, and the authors do not try to test statistically whether the thresholds are appropriate of not during the analysis.

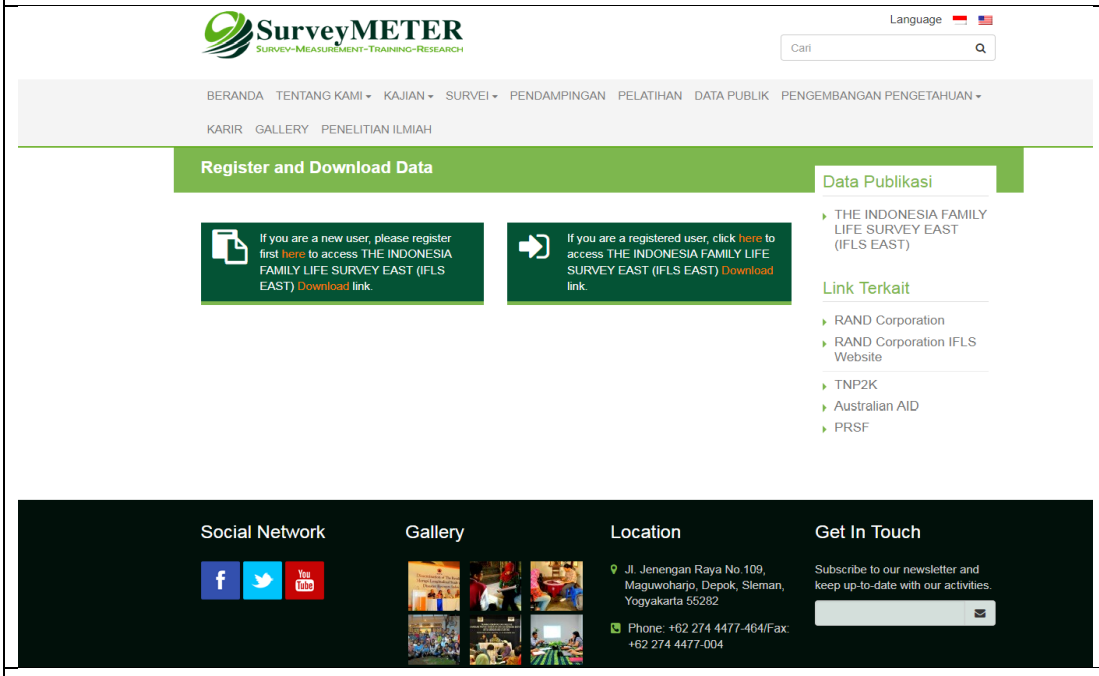
Appendix B. Registration and Permission to Download the Data

IFLS 5



The link to access the data is: https://www.rand.org/labor/FLS/IFLS/access.html

IFLS East



Subject: Registration Succes

From: noreply@surveymeter.org
To: erlanggaagustino@yahoo.com
Date: Friday, September 23, 2016, 9:49:15 PM GMT+1

Thank you for registering with IFLS East at Surveymeter.org!

Now you can log in to the data and documentation download page using your registered email address as the user name. We will send you email updates to the data and documentation. If your email address changes, please send email to iflseast@surveymeter.org

Thank you,
IFLS East Team

Appendix C. Ethical Review Application and Approval

University of BRISTOL
School for Policy Studies

RESEARCH ETHICS COMMITTEE: APPLICATION FORM

- This proforma must be completed for each piece of research carried out by members of the School for Policy Studies, both staff and doctoral postgraduate students.
- See the Ethics Procedures document for clarification of the process.
- All research **must** be ethically reviewed before any fieldwork is conducted, regardless of source of funding.
- See the School's policy and guidelines relating to research ethics and data protection, to which the project is required to conform.
- Please stick to the word limit provided. **Do not attach** your funding application or research proposal.

Key project details:

1.	**Proposer's Name**	Erlangga Agustino Landiyanto		
2.	**Proposer's Email Address:**	*El14125@bristol.ac.uk*		
3.	**Project Title**	*Comparison of Different Child Poverty Measures: Empirical Evidence from Indonesia*		
4.	**Project Start Date:**	*28/09/2016*	**End Date:**	27/09/2016

Who needs to provide Research Ethics Committee approval for your project?

The SPS REC will only consider those research ethics applications which do not require submission elsewhere. As such, you should make sure that your proposed research does not fall within the jurisdiction of the NRES system: http://www.nres.nhs.uk/applications/approval-requirements/ethical-review-requirements/
If you are not sure where you should apply please discuss it with either the chair of the Committee or the Faculty Ethics Officer who is based in RED.

Currently NRES are not expected to consider applications in respect of activities that are not research: i.e. clinical audit, service evaluation and public health surveillance. In addition REC review is not normally required for research involving NHS or social care staff recruited as research participants by virtue of their professional role. Social care research projects which are funded by the Department of Health, must always be reviewed by a REC within the Research Ethics Service for England. Similarly research which accesses unanonymised patient records must be reviewed by a REC and NIGB.

Who needs to provide governance approval for this project?

If this project involves access to patients, clients, staff or carers of an NHS Trust or Social Care Organisation, it falls within the scope of the Research Governance Framework for Health and Social. You will also need to get written approval from the Research Management Office or equivalent of each NHS Trust or Social Care Organisation.

When you have ethical approval, you will need to complete the research registration form:
http://www.bristol.ac.uk/red/research-governance/registration-sponsorship/study-notification.html
Guidance on completing this form can be found at: http://www.bristol.ac.uk/red/research-governance/registration-sponsorship/guidance.pdf. Contact the Research Governance team (http://www.bristol.ac.uk/red/people/group/red/1602) for guidance on completing this form and if you have any questions about obtaining local approval.

Do you need additional insurance to carry out your research?

Whilst staff and doctoral students will normally be covered by the University's indemnity insurance there are some situations where it will need to be checked with the insurer. If you are conducting research with: Pregnant research subjects or children under 5 you should email: insurance-enquiries@bristol.ac.uk
In addition, if you are working or travelling overseas you should take advantage of the university travel insurance.

Do you need a Disclosure and Barring Service check?

The Disclosure and Barring Service (DBS) replaces the Criminal Records Bureau (CRB) and Independent Safeguarding Authority (ISA). Criteria for deciding whether you require a DBS check are available from: https://www.gov.uk/government/organisations/disclosure-and-barring-service/about

You should specifically look at the frequency, nature, and duration of your contact with potentially vulnerable adults and or children. If your contact is a one-off research interaction, or infrequent contact (for example: 3 contacts over a period of time) you are unlikely to require a check.
If you think you need a DBS check then you should consult the University of Bristol web-page: http://www.bris.ac.uk/secretary/legal/disclosure/crbhome

5. If your research project requires REC approval elsewhere please tell us which committee, this includes where co-researchers are applying for approval at another institution. Please provide us with a copy of your approval letter for our records when it is available.

This research project does not require REC approval elsewhere

6. Have all subcontractors you are using for this project (including transcribers, interpreters, and co-researchers not formally employed at Bristol University) agreed to be bound by the School's requirements for ethical research practice?

Yes		
No/Not yet		Note: You must ensure that written agreement is secured before they start to work. They will be provided with training and sign a detailed consent form.
Not applicable	**X**	

7.	If you are a PhD/doctoral student please tell us the name of your research supervisor.

Dr. Patricia Lucas, Dr. Sebnem Eroglu-Hawksworth

Has your supervisor seen this final versions of your ethics application?

Yes	X
No	

8.	Who is funding this study?

The research is funded by the Scholarship from Indonesian Endowment Fund for Education, Ministry of Finance of Republic of Indonesia

If this study is funded by the ESRC or another funder requiring lay representation on the ethics committee and is being undertaken by a member staff, this form should be submitted to the Faculty REC.

Post-graduate students undertaking ESRC funded projects should submit their form to the SPS Committee.

9.	Is this application part of a larger proposal?

No	X
Yes	

If yes, please provide a summary of the larger study and indicate how this application relates to the overall study.

10.	Is this proposal a replication of a similar proposal already approved by the SPS REC? Please provide the SPS REC reference number.

No	X
Yes	

If Yes, please tell us the name of the project, the date approval was given and code (if you have one).

Please describe any differences (such as context) in the current study. If the study is a replication of a previously approved study. Submit these first two pages of the form.

ETHICAL RESEARCH PROFORMA

The following set of questions is intended to provide the School Research Ethics Committee with enough information to determine the risks and benefits associated with your research. You should use these questions to assist in identifying the ethical considerations which are important to your research. You should identify any relevant ethical issues and how you intend to deal with them. Whilst the REC does not comment on the methodological design of your study, it will consider whether the design of your study is likely to produce the benefits you anticipate. **Please avoid copying and pasting large parts of research bids or proposals which do not directly answer the questions.** Please also avoid using *unexplained* acronyms, abbreviations or jargon.

1. **IDENTITY & EXPERIENCE OF (CO) RESEARCHERS:** Please give a list of names, positions, qualifications, previous research experience, and functions in the proposed research of all those who will be in contact with participants

Name of Researcher: Erlangga Agustino Landiyanto

Position: PhD Student at School of Policy Studies

Qualification:

MSc. Development Evaluation and Management, University of Antwerp, Belgium (2014)

MA. Population and Reproductive Health Research, Mahidol University, Thailand (2009)

Bachelor Degree in Economics, Airlangga University, Indonesia (2005)

Function in the Proposed Research: This research is a Ph.D. Research. The Ph.D. student is primary researcher who is responsible for data analysis and report writings under the guidance of the supervisors. The researcher will conduct secondary data analysis using Indonesian Family Life Survey (IFLS) data to compare different child poverty measures. The analysis result will be used as the basis for Ph.D. thesis writing. The data consist IFLS wave 5 data from Rand Corporation that cover western and central part of Indonesia and also IFLS East data from Survey Meter that focusing on the eastern part of Indonesia,

Relevant Research Experiences

- "Multidimensional Child Poverty in Papua: Empirical Evidence from 6 Districts". This paper was presented at Child Poverty and Social Protection Conference 2013, September 10-11, 2013, in Jakarta, Indonesia. The conference paper can be downloaded at: http://cpsp.smeru.or.id/Paper,%20Abstact,%20CV/0101_Erlangga-paper.pdf. Additionally, the updated version of this paper also presented at "Global Insecurities International Conference 2014", Conducted at University of Bristol, 22 November 2014
- Lead author of "Wealth and Happiness: Empirical Evidence from Indonesia". This paper was presented at 10th Indonesian Regional Science Association (IRSA) International Conference, July 28-29, 2010, in Surabaya and selected to be published on the conference proceeding. Preliminary version of this paper is available online at: http://www.rand.org/content/dam/rand/www/external/labor/FLS/IFLS/papers/2010_landiyanto2.pdf. The Revised version of this paper is published at Chulalongkorn Journal of Economics, No 23, 2011, page 1-17

2. **STUDY AIMS/OBJECTIVES [maximum of 200 words]:** Please provide the aims and objectives of your research.

This research aims to compare different child poverty measures to determine the extent and nature of child poverty in Indonesia and to test whether different child poverty measures indicate the extent and nature of child poverty differently.

RESEARCH WITH HUMAN PARTICIPANTS

(If you are undertaking secondary data analysis, please proceed to section 11)

3.	**RESEARCH METHODS AND SAMPLING STRATEGY [maximum of 300 words]:** Please tell us what you propose to do in your research and how individual participants, or groups of participants, will be identified and sampled. Please also tell us what is expected of research participants who consent to take part (Please note that recruitment procedures are covered in question 8)
	Not Applicable (NA)

4.	**EXPECTED DURATION OF RESEARCH ACTIVITY:** Please tell us how long each researcher will be working on fieldwork/research activity. For example, conducting interviews between Feb 12 – July 2016. Also tell us how long participant involvement will be. For example: Interviewing 25 professional participants X2 for a maximum of 1 hour per interview.
	Not Applicable (NA)

5.	**POTENTIAL BENEFITS AND TO WHOM: [maximum 100 words]** Tell us briefly what the main benefits of the research are and to whom.
	Not Applicable (NA)

6.	**POTENTIAL RISKS/HARM TO PARTICIPANTS [maximum of 100 words]:** What potential risks are there to the participants and how will you address them? List any potential physical or psychological dangers that can be anticipated? You may find it useful to conduct a more formal risk assessment prior to conducting your fieldwork. The University has an example of risk assessment form: http://www.bristol.ac.uk/safety/policies/

RISK	**HOW IT WILL BE ADDRESSED**
Example 1: Participants may be upset during the interview *Example 2: A participants may tell me something about illegal activity*	*Example 1: If a participant gets upset I will stop the interview at that time. I will give participants information about support services at the end of the interview.* *Example 2: The information sheet and consent form will warn of the limits of confidentiality and I will have a confidentiality protocol (submitted to the committee).*
Not Applicable (NA)	

*Add more boxes if needed.

7. RESEARCHER SAFETY [maximum of 200 words]: What risks could the researchers be exposed to during this research project? If you are conducting research in individual's homes or potentially dangerous places then a researcher safety protocol is mandatory. Examples of safety protocols are available in the guidance.

RISK	HOW IT WILL BE ADDRESSED
Example 1: Interview at the participant's home.	*Fieldwork safety protocol will be followed. A colleague will know the start and approximate finish time of the interview. If there is no contact from the researcher, they will ring the researcher. If nocontact is made the confidential address details will be accessed and the police informed.*
Not applicable (NA)	

8. RECRUITMENT PROCEDURES [maximum of 400 words]: How are you going to access participants? Are there any gatekeepers involved? Is there any sense in which respondents might be "obliged" to participate (for example because their manager will know, or because they are a service user and their service will know), if so how will this be dealt with.

Not Applicable(NA)

9. INFORMED CONSENT [maximum of 200 words]: How will this be obtained? Whilst in many cases written consent is preferable, where this is not possible or appropriate this should be clearly justified. An age and ability appropriate participant information sheet (PIS) setting out factors relevant to the interests of participants in the study must be handed to them in advance of seeking consent (see materials table for list of what should be included). If you are proposing to adopt an approach in which informed consent is not sought you must explain in detail why this is not considered to be appropriate. If you are planning to use photographic or video images in your method then additional specific consent should be sought from participants.

Not Applicable (NA)

Please tick the box to confirm that you will keep evidence of the consent forms (either actual forms or digitally scanned forms), securely for twenty years.	NA

10. If you intend to use an on-line survey (for example Survey Monkey) you need to ensure that the data will not leave the European Economic Area i.e. be transferred or held on computers in the USA

Please tick the box to confirm that you will not use any on-line survey service based in the USA or outside the European Economic Area (EEA).	NA

11.	**DATA PROTECTION**: All applicants should regularly take the data protection on-line tutorial provided by the University in order to ensure they are aware of the requirements of current data protection legislation. University policy is that "personal data can be sent abroad if the data subject gives unambiguous written consent. Staff should seek permission from the University Secretary prior to sending personal data outside of the EEA". Any breach of the University data protection responsibilities could lead to disciplinary action.
	Have you taken the mandatory University data protection on-line tutorial in the last 12 months? **https://www.bris.ac.uk/is/media/training/uobonly/datasecurity/page_01.htm**

Yes	**X**
No	

Do you plan to send any information/data, which could be used to identify a living person, to anybody who works in a country that is not part of the European Union?
See http://www.ico.gov.uk/for_organisations/data_protection/the_guide/principle_8.aspx)

No	**X**	
Yes		If **YES** please list the country or countries:

Please outline your procedure for data protection. It is University of Bristol policy that interviews must be recorded on an encrypted device. Ideally this should be a University owned encrypted digital recorder (see http://www.bristol.ac.uk/infosec/uobdata/transcription/)

It is University of Bristol policy that data is stored in an anonymised format for future use by other researchers (see http://data.bris.ac.uk/). What level of future access to the anonymised data will there be:

- Open access
- Restricted access - what restrictions?
- Closed access - on what grounds?

No new data will be collected. The analyses will be based on IFLS 5 and IFLS East data that is already open access via the websites of the RAND Corporation and Survey meter. Both of them are open datasets that can be accessed freely by public with permission. Both of the datasets have similar procedures for acquiring permission. The permission can be obtained through filling the online registration form. After registering online, I will be able to login and download the data.

12.	**CONFIDENTIALITY AND ANONYMITY**	**Yes**	**No**
	All my data will be stored on a password protected server	**X**	
	I will only transfer unanonymised data if it is encrypted. (For advice on encryption see: http://www.bristol.ac.uk/infosec/uobdata/encrypt/device/)	**X**	
	If there is a potential for participants to disclose illegal activity or harm to others you will need to provide a confidentiality protocol.	**X**	

Please tick the box to **CONFIRM** that you warned participants on the information and consent forms that there are limits to confidentiality and that at the end of the project data will be stored for 20 years on appropriate storage facility. https://www.acrc.bris.ac.uk/acrc/storage.htm	X

Please outline your procedure for ensuring confidentiality and anonymity.
The data is open data and already protect the identity of the informants for ensuring confidentiality and anonymity. According to their survey manuals, The enumerators of IFLS 5 and IFLS EAST should inform the respondents that their confidentiality and anonymity will be protected. Both of surveys request consent from the respondents during data collection and collect data only from respondents who are willing to participate and giving consents. The respondents who refused to participate would be recorded as non-response. Neither dataset, IFLS 5 and IFLS East, includes the respondents' name or address. It is a condition of use of the IFLS data that users respect the confidentiality of respondents http://www.rand.org/labor/FLS/IFLS/datanotes.html#hspc Additionally, it is not possible to identify individuals from the data provided. Only Provinces and Districts names are recorded with clear identification. Indonesian provinces have a population between 600,000 and 30,000,000 inhabitants. Districts-level areas, part of the provinces, have populations between 20,000 and 3,000,000 inhabitants. Other information, such as communities are reported by codes (without codebooks of community names). Therefore, it is not possible to link to these codes to the name or location of the community. Researchers cannot, therefore, identify which village or sub-district the data comes from. Also, there is no information about individual names in datasets. Both data providers, Rand Corporation and survey meters, also have a policy not to reveal the information beyond the information in the dataset (for example, they will not reveal the name of subdistricts and communities). Therefore, it will not be possible for data users to identify any individual in the datasets.

Please proceed to question 15.

SECONDARY DATA ANALYSIS

13. Secondary Data Analysis

Please briefly explain;

(1) What secondary datasets you will use?
(2) Where did you get these data from (e.g. ESRC Data Archive)?
(3) How did you obtain permission to use these data? (e.g. by signing an end user licence)
(4) Do you plan to make derived variables and/or analytical syntax available to other researchers? (e.g. by archiving them on data.bris or at the UK Data Archive)
(5) Where will you store the secondary datasets?

The questions above will be answered subsequently in order as follow:

1. This research will apply secondary analysis using Indonesian Family Life Survey (IFLS) data. Two IFLS datasets that will be used, IFLS 5 and IFLS-East. Household per-capita expenditure analysis, which is supported by child cost analysis and the utilisation of equivalence scales, will be used for developing monetary child poverty measurements from the lenses of both absolute and relative poverty. The non-monetary analysis will be conducted to understand the extent and nature of deprivation of children from the lenses of absolute deprivation, relative deprivation, and social exclusion. Finally, the overlap between different child poverty measures will be investigated to obtain a comprehensive picture of child poverty in Indonesia.
2. The IFLS 5 dataset can be downloaded from the website of RAND Corporation (http://www.rand.org/labor/FLS/IFLS/ifls5.html). The IFLS East Dataset can be downloaded from Survey meter website (http://surveymeter.org/research/3/iflseast).
3. The IFLS and IFLS-East are open datasets that can be accessed freely by public with permission. Both of the datasets have similar procedures for acquiring permission. The permission can be obtained through filling the online registration form. After registering online, I will be able to login and download the data. RAND Corporation and Survey Meter use the registration for monitoring the data uses, such as getting the basic profile of the data.
4. I do not plan to make derived variables and/or analytical syntax available to other researchers.
5. The data will be downloaded to data.bris Research data Repository for analysis, but will not be stored here after the completion of my studies. I will suggest any researchers who would like to use IFLS and IFLS East data to download the data directly from RAND and Survey Meter.

DATA MANAGEMENT

14. Data Management

It is RCUK and UoB policy that all research data (including qualitative data e.g. interview transcripts, videos, etc.) should be made freely and openly available for other researchers to use via the data.bris Research Data Repository and/or the UK Data Archive. This raises a number of ethical issues, for example you MUST ensure that consent is requested to allow data to be shared and reused.

Please briefly explain;

1) How you will obtain specific consent for data preservation and sharing with other researchers?
2) How will you protect the identity of participants? e.g. how will you anonymise your data for reuse.
3) How will the data be licensed for reuse? e.g. Do you plan to place any restrictions on the reuse of your data such as Creative Common Share Alike 2.0 licence (http://creativecommons.org/licenses/by-sa/2.0/uk/)
4) Where will you archive your data and metadata for re-use by other researchers?

As this study relies on analysis of data already collected and published, consent and management is inherited from the data owners. Specifically:

1. I perceive that the getting consent for data sharing may not be necessary because the data is open data, that means the data can be access by public. However, the meaning of Re-Use here is a bit tricky. Rand and Survey Meter expect that every data user register for using the data, as basis to track data utilization. When other people re-use the data, without informing Rand and Survey meter, they will lost in track. Therefore, it will better if other researcher obtain the data directly from Rand Corporation and Survey meter.
2. I do not need to make an additional adjustment to protect the identity of the respondents. Rand and Survey Meter already protect the identity of the informants through hide any information related to individual identity such as individual name and address as well as community name.
3. The data and metadata are openly published and can be downloaded from Rand Corporation and Survey Meter websites.

Please proceed to question 15.

PLEASE COMPLETE FOR ALL PROJECTS

15. DISSEMINATION OF FINDINGS [maximum 200 words]: Are you planning to send copies of data to participants for them to check/comment on? If so, in what format and under what conditions? What is the anticipated use of the data, forms of publication and dissemination of findings etc.? .

- The data is a secondary data and I do not have access to the participants. Therefore, I will not send copies the data to participant.
- I may disseminate the preliminary result in the conferences.
- The final result can be accessed in my Ph.D. thesis
- I may disseminate some of final result in the academic journals.

16. ADDITIONAL INFORMATION: Please identify which of the following documents, and how many, you will be submitting within your application: Guidance is given at the end of this document (appendix 1) on what each of these additional materials might contain.

Additional Material:	**NUMBER OF DOCUMENTS**
Participants information sheet (s)	NA
Consent form (s)	NA
Confidentiality protocol	NA
Recruitment letters/posters/leaflets	NA
Photo method information sheet	NA
Photo method consent form	NA
Support information for participant	NA
3rd party confidentiality agreement	NA

Please DO NOT send your research proposal or research bid as the Committee will not look at this

SUBMITTING AND REVIEWING YOUR PROPOSAL:

- To submit your application you should create a single PDF document which contains your application form and all additional material and submit this information to the SPS Research Ethics Administrator by email to sps-ethics@bristol.ac.uk
- If you are having problems with this then please contact the SPS Research Ethics Administrator by email (sps-ethics@bristol.ac.uk) to discuss.
- Your form will then be circulated to the SPS Research Ethics Committee who will review your proposal on the basis of the information provided in this single PDF document. The likely response time is outlined in the 'Ethics Procedures' document. For staff applications we try to turn these around in 2-3 weeks. Doctoral student applications should be submitted by the relevant meeting deadline and will be turned around in 4 weeks.
- Should the Committee have any questions or queries after reviewing your application, the chair will contact you directly. If the Committee makes any recommendations you should confirm, in writing, that you will adhere to these recommendations before receiving approval for your project.

- Should your research change following approval it is your responsibility to inform the Committee in writing and seek clarification about whether the changes in circumstance require further ethical consideration.

Failure to obtain Ethical Approval for research is considered research misconduct by the University and is dealt with under their current misconduct rules.

Chair:	Beth Tarleton (beth.tarleton@bris.ac.uk)
Administrator:	Zaheda Tariq (sps-ethics@bristol.ac.uk)
Date form updated by SPS REC:	February 2016.

Untitled

Beth Tarleton

Tue 07/06/2016 12:25

To: Erlangga Agustino Landiyanto <el14125@bristol.ac.uk>;

Dear Erlangga

Thank you for submitting your application to the School for Policy Studies Research Ethics Committee regarding your study:

Comparison of Different Child Poverty Measures: Empirical Evidence from Indonesia (SPSREC14-15.A72)

Please take this email as confirmation of ethical approval by the SPS REC. If you require a formal letter of approval, please contact Zaheda.

Good luck with your research

Beth

--
Beth Tarleton
Senior Research Fellow and
Co-ordinator of WTPN wtpn.co.uk
Norah Fry Centre for Disability Studies
School for Policy Studies
University of Bristol
0117 3310976

Appendix D. Missingness in Key Survey Items (IFLS+ data)

Table D-1. Proportion of missing responses in each key survey item (eligible sample n=21396 children)

Key Items	Age References	% Missing
Household Expenditure	0-17	0
Household Income	0-17	0.25
Households Assets	0-17	0.33
Do not have Mobile phone	0-17	0
Do not have Internet Access	0-17	0
Do not have TV	0-17	0
Participate in Paid Work	0-15	0
Participate in Unpaid Work	0-15	0
Do not go to school or finish primary education	7-17	0
Eat less than three times per day	0-15	0
Did not consume Protein	0-15	0
Stunting	0-5	0
Underweight	0-5	0
Wasting	0-5	0
Feeling Bad about Health Condition	0-15	0
Days missing because of poor health	0-15	0
Days in bed because of poor health	0-15	0
Perceived have worse health	0-15	0
Did not receive immunisation	0-5	0
Did not receive treatment for illness	0-15	0
Do not meet parent frequently	0-15	0
Do not Involve in Decision-making	13-17	0
Inadequate roofing	0-17	0
Inadequate flooring	0-17	0
Inadequate ventilation	0-17	0
Cook in same place for sleep	0-17	0
House surrounded by human and animal waste	0-17	0
House surrounded by trash	0-17	0
House surrounded by stagnant water	0-17	0
House without well maintain yard	0-17	0
Using surface water for drinking	0-17	0
Water sources located less than 200 meters	0-17	0
House do not have access to improve sanitation	0-17	0
House do not have electricity	0-17	0
Households do not use clean cooking fuel	0-17	0
Living in house with more than 4 people per room	0-17	0
Households do not have transport vehicle	0-17	0
Cannot be accessed by Public transport	0-17	1.2
Do not feeling safe in the neighbourhood	0-17	0

Appendix E. Supplement for Monetary Measure

Table E-1. Corresponding data sources for each expenditure item

Food Expenditures	**Non-Food Expenditures**
During Past Week (Bought and Self-produced: Book 1 KS2 and KS3) • Staple foods • Vegetables • Dried foods • Meat and fish • Milk/eggs • Spices • Beverages and other drinks/consumer products During Past Weeks (Book 1: KS4B) • Estimated value of food items provided to other people	During Past Month (Book 1: KS06) • Electricity • Water • Fuel • Communication • Personal toiletries • Small household items • Domestic services and servants' wages • Recreation and Entertainment (Leisure) • Transportation • Lottery and gambling • Revolving savings (Arisan) • Estimated value of non-food items provided to other people • Estimated of items above which are self-produced During Past Year (Book 1: KS8 and KS9) • Clothing for children and adults • Household supplies and furniture • Medical costs • Ritual ceremonies, charities and gifts • Taxes • Other expenditures not specified above: Including the purchase of cars, house, television sets, handphones, beds, livestock and the like • Value of non-food items given to others/other parties outside the household on an irregular basis (less than twelve times per year) During past year (Book 1) • Schooling (KS10a, KS11a, KS12a and KS12b) During past year (Book 2) • Rental cost (if renting house) (KR04a) • Estimated rental cost willing to pay (if living in an owned house) (KR06a)

Appendix F. Supplement for Multidimensional Child Poverty: Absolute Deprivation

Table F-1. Corresponding data sources for each absolute deprivation item

Indicators	IFLS 5	IFLS East
Education	Book K AR16, AR17, AR18	Book K AR16, AR17, AR18
Health	Book 5 RJA28a, RJA29, RJA29a, RJA30 MAA01 = 1 & PSA01 =3 or RJA0a=3 or RJA01a=3	Book 5 RJA28a, RJA29, RJA29a, RJA30 MAA01 = 1 & PSA01 =3 or RJA0a=3 or RJA01a=3
Food	Book US US03, US04 & US06	Book US US03, US04 & US06
Information	Book 5 DLA03b, DLA03d & DLA03e Book 2 KR 24a	Book 5 DLA03b, DLA03d & DLA03e Book 2 KR 24a
Water	Book 2 KR13 & KR 16	Book 2 KR13 & KR 16
Sanitation	Book 2 KR20	Book 2 KR20
Shelter	Book K KRK6 & KRK8	Book K KRK6 & KRK8

Table F-2. Level and intensity of absolute deprivation by individual, household, and geographical characteristics (1 Domain level items)

Subgroups		Average number of deprivations	Intensity of deprivation (1 items) (0-100 Scale)	Adjusted headcount ratio (1 items) (%)
Sex of children	Male	1.52	28.36	13.53
	Female	1.54	28.64	13.60
Education level of household head	No schooling or primary dropout	2.10***	38.59***	26.98***
	Primary school	1.61***	29.88***	17.01***
	Junior high school	1.48***	27.52***	13.65***
	Senior high schools	1.34***	25.12***	9.05***
	University	1.19***	22.44***	6.76***
Sex of household head	Male	1.54	28.71	13.67
	Female	1.47	27.06	12.88
Religious affiliation of household head	Other religions	2.01***	37.10***	25.42***
	Islam	1.39***	26.02***	11.39***
Occupation of household head	Not working or doing unpaid work	1.47***	27.32***	12.80***
	Doing paid work	1.54***	28.73***	13.72***
Value of the household assets (quintile range in Indonesian million Rp.)	Lowest (0–12.8M)	1.79***	33.19***	19.58***
	Lower (12.8–40.8M)	1.65***	30.52***	17.19***
	Medium (40.8–96.5M)	1.45***	27.07***	13.21***
	Higher (96.5–222M)	1.32***	24.57***	10.12***
	Highest (>222M)	1.27***	23.61***	7.58***
Areas	Urban	1.23***	22.99***	7.83***
	Rural	1.70***	31.55***	19.28***
Islands	Java	1.35***	25.21***	10.32***
	Outside Java	1.70***	31.48***	17.56***
Total		1.53	28.50	13.57

Appendix G. Note: *** is significant at 0.01, ** is significant at 0.05. The threshold for level and intensity of absolute deprivation is 2 domain level items.

Appendix H. Supplement for Multidimensional Child Poverty: Relative Deprivation

Table H-1. Identification of preliminary list of relative deprivation domains and indicators based on previous studies

Evidence from Previous Studies	Domain	Indicator	Ages
Wisor et al. (2015) found that more than half population consider information and communication devices are important necessities. The devices can be in the form of television, radio, internet access, and telephone which will benefit family members. In the context of children, the children who participants in previous studies inform that that getting a mobile phone is one of their sources of well being (SMERU, 2011), and consider not having mobile phone as poor (Reality Check Approach Plus and UNICEF Indonesia, 2017).	Information and communication	Children do not have a mobile phone	13-17
		Children do not have internet access at home	05-17
		Children do not have access to television	05-17
Bessell (2009) informs that earn money for their family is one of the main purpose of working children, especially for children who have strong connection to the family. Sometimes those children are working with consent from their parents, which is an indication of child labour (Bessell, 2009). Undertaking unpaid work can also becoming issues, especially while it conflicting with other activities While it is debatable, SMERU (2011) found in the FGDs of female student that not obliged to do domestic chores is something that is expected by children. However, SMERU (2011) does not explain in greater detail about the domestic chores.	Child Labour	Children participate in Paid Work	5-17
		Children participate in non-paid work for more than acceptable number of hours	5-15
Education is a major issue based on the qualitative study. The issue is not only expressed by adults (Wisor et al., 2015), but also by Children (Bessell, 2009; SMERU, 2011). Children viewed unable to pay tuition fees as one of description of being poor (Reality Check Approach Plus and UNICEF Indonesia, 2017). Bessell (2009) found that street children and working children actually have intention of going to school and become students. However, they are excluded from formal education. Income poverty become their major reason because those children found difficulties to afford the cost of schooling, some of them also feel shame to their classmates at school when they are poor and choose to drop out from school (Bessell, 2009). Education quality also major issues. Which is not only about the quality of supply of education services and quality of education infrastructure, but also related to achievement of the children at school (SMERU, 2011).	Education	Children of school age have never been to school or are not currently attending school	7-17

Evidence from Previous Studies	Domain	Indicator	Ages
Wisor et al. (2015) found that food is one of the most important items. They are confirmed by the data from 2007 AsiaBarometer survey data that inform 60% of Indonesian perceive that food is important necessities (Inoguchi, 2008). Children view unable of afford food as indication of poverty (Reality Check Approach Plus and UNICEF Indonesia, 2017). However, the lack of food is not necessarily about how often you eat, but also "what you eat" such as able to eat meat, fish or children daily which considered as expensive from the lenses of the poor (Reality Check Approach Plus, 2015a). Lack of food or nutrition intake can be a cause of malnutrition. Malnutrition is important issues for children and will harm their development (Reality Check Approach Plus, 2015b)	Food and Nutrition	Children are unable to eat three times a day	0-15
		Children do not have access to sources of protein daily	0-15
		Children are more than three standard deviations below the international reference population for stunting - height for age (*Stunting*)	0-4
		Children are more than three standard deviations below the international reference population for underweight-weight for age (*Underweight*)	0-4
		Children are more than three standard deviations below the international reference population for wasting -weight for height (*Wasting*)	0-4
Wisor et al. (2015) that found health condition is one of the most important necessities of the households according to adult views. The finding supported by AsiaBarometer survey (Inoguchi, 2008) found that almost 80% Indonesian perceived that being healthy one of important aspect of life. In the focus group discussion with children, children participant informed that poor health condition such as frequent pain, headaches and malaria were also becoming problems that contribute to their sense of deprivation (SMERU, 2011). However, health data are limited and the majority of indicators of health condition such as feeling pain, headaches, malaria, are not necessarily fit for relative deprivation measure. In this case, the subjective indicators of health may be a better fit.	General Health Status	Children whose health condition leaves them feeling badly on a daily basis	0-15
		Children have missed significant activity days because of poor health in the last 4 weeks	0-15
		Children have spent a number of days in bed because of poor health in the last 4 weeks	0-15
		Children's health condition is felt worse compared to their health condition 12 months ago	0-15
Access of health care is also considered as important necessities according to Wisor et al. (2015). Since Wisor et al. (2015) do not focus on children, the measure of health case should be child focus and the indicators can be selected from the existing healthcare measures. In the focus group discussion, children in rural sites also raise of issues of the availability and adequacy of health care facilities in their area as well as high price of ambulances (SMERU, 2011).	Health Care	Children did not receive any immunisations against disease	0-4
		Children did not receive health treatment for a recent illness involving an acute respiratory infection or diarrhoea	0-15

Evidence from Previous Studies	Domain	Indicator	Ages
Social interaction is an important necessity for children. Social interaction mainly related to the relation of the children with their family. Within families, the focus group discussion (FGD) participants, confirmed by almost 80% respondents of follow up studies, inform that family relationship is important necessities of individuals (Wisor et al., 2015). It is also confirmed by students who inform that receiving love and affection from parents, gathering with family and being with parents increase their well being (SMERU, 2011).	Social Interaction with Family (Social)	Children are unable to meet their father and mother frequently.	0-4
According to (Doyal and Gough, 1991), autonomy is one of the basic needs, which the study of Bessell (2009) inform that children inform that involvement in decision making will increase their well being).	Autonomy	Children are excluded from decision making in the household	13-17
In the focus group discussion, the participants inform that shelter is their essential necessities for their families, which confirmed by more than 90% respondents in follow up survey (Wisor et al., 2015). They are confirmed by the data from 2007 AsiaBarometer survey data that inform 57.5% of Indonesian perceive that having a comfortable home is important necessities (Inoguchi, 2008). Therefore, home-ownership is an important issue. More specific to the children, Inadequate shelter or difficulties afford shelter also one of the key deprivation (Bessell, 2009). Children perceived that what kind of shelter they live (i.e. the material of the shelter) help them to describe who are poor (Bima et al., 2017; Reality Check Approach Plus and UNICEF Indonesia, 2017).	Shelter	Children are living in a house with inadequate roofing.	0-17
		Children are living in a house with inadequate flooring (i.e. a mud or dung floor)	0-17
		Children's house lacks adequate ventilation	0-17
		Children's house cooking room is also the sleeping room	0-17
		Children's house has 4 or more people per room	0-17
In the focus group discussion, the participants inform that healthy environment are their essential necessities which are confirmed by 65% respondents at the follow up quantitative data collection and analysis (Wisor et al., 2015).	Environmental Health and Hygienies	Children's house surrounded by human and animal waste	0-17
		Children's house surrounded by pile of trash	0-17
		Children's house surrounded by stagnant water	0-17
		Children is living in house without a moderately sized yard which well maintained	0-17
In the focus group discussion, the participants inform that water is their essential necessity (Wisor et al., 2015),. In the follow up quantitative data collection, Wisor et al. (2015) found that almost 95% of respondents perceived that drinking water is essential necessity.	Water	Children use surface water for their source of drinking water	0-17
		Children's house is more than 200 meters	0-17

Evidence from Previous Studies	Domain	Indicator	Ages
		away from drinking water sources	
In the focus group discussion, the participants inform that sanitation is their essential necessity (Wisor et al., 2015). It confirmed by the follow-up data collection that informs 80% of respondents believe sanitation is important necessity for family (Wisor et al., 2015)	Sanitation	Children do not have access to improve sanitation	0-17
The focus group discussions' participants inform that electricity is one of their essential necessities for their families (Wisor et al., 2015). In the follow-up data collection, Wisor et al. (2015) found that more than 70% of targeted respondents consider electricity as one domain to identify poverty. People will be deprived of electricity when do not have access to electricity. The issues of water are also raised by children, especially when water is lacking (SMERU, 2011). The other study (Reality Check Approach Plus, 2015a) pays more attention to the access to metered electricity.	Electricity	The household does not have access to Electricity	0-17
In the focus group discussion, the participants inform that fuel is one of their necessities (Wisor et al., 2015), which confirmed by 70% of targeted respondents in the follow up data collection who consider cooking fuel as one of essential domains for identification of poverty. People will be considered as deprived in cooking fuel when using unhealthy cooking fuel in the house such as coal, dung or wood (Wisor et al., 2015).	Fuels	The household does not use clean cooking fuel (electricity, gas and kerosene)	0-17
In focus group discussion, Wisor et al. (2015) found that people will be deprived when the major services are far from their residence and they need to take a long and uncomfortable journey to reach the services. About 50% of respondents perceived that location of necessary services and resources (such as health centre, school, market etc) are essential necessities (Wisor et al., 2015). Geographic mobility is also related to how children and their families can move to one place to other. During FGDs, the children mention that living in the remote location will limit their mobility and make them feel deprived (SMERU, 2011). Access to public transport (Bima et al., 2017), the family own transport vehicle (Bima et al., 2017) or the children have bicycle will help to increase their mobility (SMERU, 2011).	Transportation	Household does not own a transport vehicle.	0-17
		Children lack access to public transportation that stops at their village.	0-17
Children participant inform that evidences experience and feeling of unsafe, and insecurity contribute to sense of deprivation children (SMERU, 2011)	Safety	Children are living in neighbourhood that perceived as unsafe.	0-17

Note: Indicators of general health status, health care and food and nutrition cannot cover age 16-17 because the data are not available.

Table H-2. Corresponding data sources for each relative deprivation item

Indicators	IFLS 5	IFLS East
No mobile phone	Book 5 DLA03b	Book 5 DLA03b
No internet access	Book 5 DLA03d if DLA03e =a or e	Book 5 DLA03d if DLA03e =a or e
No TV	Book 2 KR 24a	Book 2 KR 24a
Paid work	Book 5 DLA56a1	Book 5 DLA56a1
Unpaid work	Book 5 DLA56a4	Book 5 DLA56a4
Did not go to school or finish primary education	Book K AR16, AR17, AR18	Book K AR16, AR17, AR18
Eating less than three times per day	Book 5 FMA01	Book 5 FMA01
Insufficient protein	Book 5 FMA02 & FMA03	Book 5 FMA02 & FMA03
Stunting	Book US US03 & US04	Book US US03 & US04
Underweight	Book US US04 & US06	Book US US04 & US06
Wasting	Book US US03 & US06	Book US US03 & US06
Feeling bad about health condition	Book 5 MAA0a	Book 5 MAA0a
Missed days because of poor health	Book 5 MAA0b	Book 5 MAA0b
Spent days in bed because of poor health	Book 5 MAA0c	Book 5 MAA0c
Perceived deterioration of health	Book 5 MAA0d	Book 5 MAA0d
Did not receive immunisation	Book 5 RJA28a, RJA29, RJA29a, RJA30	Book 5 RJA28a, RJA29, RJA29a, RJA30
Illness untreated	Book 5 MAA01 = 1 & PSA01 =3 or RJA0a=3 or RJA01a=3	Book 5 MAA01 = 1 & PSA01 =3 or RJA0a=3 or RJA01a=3
Infrequent contact with parents	Book 5 BAA04 & BAA05	Book 5 BAA04 & BAA05
Excluded from decision-making	Book 3A PK18	Book 3A PK 18
Inadequate roofing	Book K KRK10	Book K KRK8
Inadequate flooring	Book K KRK8	Book K KRK10
Inadequate ventilation	Book K KRK2E	Book K KRK2E
Cook in same place for sleep	Book K KRKI	Book K KRKI
Overcrowded house	Book K KRK6	Book K KRK6
House surrounded by waste	Book K	Book K

Indicators	IFLS 5	IFLS East
	KRK2A	KRK2A
House surrounded by trash	Book K KRK2B	Book K KRK2B
House surrounded by stagnant water	Book K KRK2C	Book K KRK2C
House without well-maintained yard	Book K KRK2F KRK2G	Book K KRK2F KRK2G
Using surface water for drinking	Book 2 KR13	Book 2 KR13
Water sources over 200 meters away	Book 2 KR15	Book 2 KR15
Lacks access to improved sanitation	Book 2 KR20	Book 2 KR20
House without electricity	Book 2 KR 11	Book 2 KR 11
Household does not use clean cooking fuel	Book 2 KR 24	Book 2 KR 24
Household does not have transport vehicle	Book 2 HR 01	Book 2 HR 01
Village inaccessible by public transport	CF Book 1A A6	CF Book 1 A6
Neighbourhood perceived as unsafe	CF Book 1C TR 5	CF Book 1 TR 5

Table H-3. Comparison of relative deprivation rates based on raw sum score and item response theory by individual, household, and geographic characteristics subgroups

		Proportions of children identified as deprived									
		Children age 0-4		Children age 5-6		Children age 7-12		Children age 13-15		Children age 16-17	
		Raw Sum Score (%)	Item response theory (%)	Raw Sum Score (%)	Item response theory (%)	Raw Sum Score (%)	Item response theory (%)	Raw Sum Score (%)	Item response theory (%)	Raw Sum Score (%)	Item response theory (%)
Sex of the children	Male	30.89	24.76	30.65	24.61	33.00	26.46	29.35	23.94	28.63***	25.11**
	Female	30.58	24.14	32.07	25.94	34.28	28.29	32.12	25.30	34.28***	28.13**
Education level of the household head	No schooling or primary dropout	61.83***	55.98***	68.01**	55.56**	69.29***	62.59***	73.58***	64.64***	55.95***	51.98***
	Primary school	43.52***	34.52***	48.88**	39.94**	49.46***	41.06***	43.88***	35.75***	44.26***	38.25***
	Junior high school	31.52***	24.68***	28.89**	21.69**	32.03***	24.99***	25.26***	19.71***	26.55***	21.68***
	Senior high schools	18.45***	14.22***	15.79**	13.01**	17.30***	12.95***	14.54***	10.19***	13.00***	8.83***
	University	7.21***	5.22***	5.27**	3.52**	6.00***	3.84***	6.06***	4.27***	6.11***	4.94***
Sex of household head	Male	31.02	24.94	31.07	25.26	33.05**	26.99**	30.29**	24.78	31.16	26.27
	Female	28.69	20.91	33.70	25.31	37.43**	29.69**	33.21**	23.62	32.95	28.36
Religious affiliation of the household head	Other religions	60.30***	56.46***	61.75***	57.54***	63.85***	60.06***	60.38***	57.96***	51.79***	50.52***
	Islam	25.66***	18.96***	25.27***	18.80***	27.48***	20.71***	25.55***	18.80***	28.54***	23.19***
Occupations of the household head	Not working or doing unpaid work	27.80**	19.67***	27.66**	21.28**	35.21	26.93**	28.98	22.77	37.58	32.09
	Doing paid work	31.36**	25.47***	32.06**	26.03**	33.29	27.41**	31.07	24.99	29.92	25.24
Asset status of the household (Quintile Range in Indonesian Million Rp.)	Lowest (0M -12.8M)	50.69***	40.86***	53.76***	47.66***	51.77**	43.37**	48.76	41.24	48.90	42.18
	Lower (12.8M-40.8M)	40.85***	33.39***	46.17***	39.59***	51.09**	41.42**	47.19	38.45	45.62	37.76
	Medium (40.8M-96.5M)	31.56***	23.67***	34.08***	22.34***	32.09**	25.23**	33.73	25.48	36.31	30.47
	Higher (96.5M-222M)	18.68***	15.69***	14.48***	11.84***	20.72**	17.01**	14.76	11.64	21.65	19.64
	Highest (More than 222M)	8.54***	5.89***	8.37***	5.57***	11.13**	8.72**	9.38	6.88	9.55	7.09

		Proportions of children identified as deprived									
		Children age 0-4		Children age 5-6		Children age 7-12		Children age 13-15		Children age 16-17	
		Raw Sum Score (%)	Item response theory (%)	Raw Sum Score (%)	Item response theory (%)	Raw Sum Score (%)	Item response theory (%)	Raw Sum Score (%)	Item response theory (%)	Raw Sum Score (%)	Item response theory (%)
Areas	Urban	13.58***	8.08***	11.60***	6.59***	13.79***	8.13***	11.96***	6.87***	13.96***	9.50***
	Rural	47.59***	40.55***	50.47***	43.34***	53.07***	46.21***	49.74***	42.61***	51.38***	46.11***
Islands	Java Island	20.48***	14.14***	21.28***	14.67***	22.48***	16.32***	20.87***	14.57***	24.89***	20.40***
	Outside of Java Islands	43.59***	37.38***	43.53***	38.07***	46.39***	39.99***	44.03***	38.20***	40.60***	35.28***
Total		30.74	24.47	31.35	25.26	33.61	27.34	30.71	24.61	31.46	26.63

Note: The differences within each subgroup were tested using ANOVA. *** is significant at 0.01, ** is significant at 0.05, * is significant at 0.1.

Appendix I. Supplement for Comparison of Child Poverty Measures

Table I-1. Subgroup comparisons of proportion of poor children experiencing multiple forms of poverty: Comparison of individual, household and geographic characteristics of children experiencing more than one form of poverty.

		Proportion of Children Who Experience Monetary Poverty (10.43% of all children)				Proportion of Children Who Experience Both Absolute (AD) & Relative Deprivation (RD) (13.07% of all children)		Proportion of Children Who Experience either absolute (AD) or relatively deprivation (RD) (26.10% of all children)		Proportion of Children Who Experience Relative deprivation (RD) only (excluding absolute deprivation) (10.52% of all children)	
		RD only (n=2,961)	Both AD & RD (n=1,932)	Either AD or RD (n=5,432)	Neither AR nor RD (n=15,964)	MCP Poor (n=2,533)	MCP Non-Poor (n=18,863)	MCP Poor (n=2,533)	MCP Non-Poor (n=18,863)	MCP Poor (n=2,533)	MCP Non-Poor (n=18,863)
Sex of the children	Male	18.15	29.92	22.18	5.79	35.63	9.94	61.69	25.79	21.42	11.51
	Female	15.90	29.16	20.65	5.64	38.55	10.64	61.46	26.83	19.95	11.98
Education level of household head	No schooling or primary dropout	28.35***	40.43***	36.26***	15.10***	58.91***	34.04***	79.51***	54.82	18.14	17.99
	Primary school	18.72***	28.51***	22.52***	10.35***	34.47***	15.90***	61.79***	39.11***	23.05	18.42
	Junior high school	13.37***	26.80***	17.22***	6.27***	32.49***	9.25***	52.82***	26.46***	17.13	11.57
	Senior high schools	10.94***	27.62***	15.36***	2.12***	35.56***	4.19***	58.68***	14.52***	18.26	6.67
	University	11.38***	18.74***	9.54***	1.41***	22.30***	1.95***	33.90***	6.49***	11.60	1.82
Sex of household head	Male	15.83***	30.78*	21.47**	5.27***	39.85***	10.11**	63.65***	26.27	19.72**	11.83
	Female	25.07***	20.82*	21.07**	8.75***	21.29***	11.43**	50.10***	26.49	26.28**	11.09
Religious affiliation of household head	Other religions	19.09***	39.32***	31.09***	4.22**	73.09***	28.88***	91.76***	52.08***	18.63	20.22***
	Islam	16.39***	21.51***	17.04***	5.87**	21.27***	7.30***	48.41***	22.16***	21.63	10.38***
Occupations of household head	Not working or doing unpaid work	22.13***	27.81	22.77***	9.47***	23.80***	9.45***	48.91***	25.35***	20.84	11.21

		Proportion of Children Who Experience Monetary Poverty (10.43% of all children)				Proportion of Children Who Experience Both Absolute (AD) & Relative Deprivation (RD) (13.07% of all children)		Proportion of Children Who Experience either absolute (AD) or relatively deprivation (RD) (26.10% of all children)		Proportion of Children Who Experience Relative deprivation (RD) only (excluding absolute deprivation) (10.52% of all children)	
		RD only (n=2,961)	Both AD & RD (n=1,932)	Either AD or RD (n=5,432)	Neither AR nor RD (n=15,964)	MCP Poor (n=2,533)	MCP Non-Poor (n=18,863)	MCP Poor (n=2,533)	MCP Non-Poor (n=18,863)	MCP Poor (n=2,533)	MCP Non-Poor (n=18,863)
	Doing paid work	16.03***	29.85	21.17***	4.94***	40.65***	10.44***	65.06***	26.47***	20.69	11.84
Value of household assets (quintile range in Indonesian million Rp.)	Lowest (0 - 12.8M)	21.75***	34.33	27.36***	8.07***	48.90	19.12***	74.40	40.37	23.32	17.15**
	Lower (12.8-40.8M)	20.60***	34.35	25.75***	9.08	42.33	15.87***	68.95	39.01	23.47	17.74**
	Medium (40.8-96.5M)	12.51***	24.06	15.99***	6.79	29.61	9.87***	50.24	27.87	17.37	12.83**
	Higher (96.5-222M)	12.28***	15.59	12.42***	5.49	14.78	5.87***	35.22	18.22	16.14	8.46**
	Highest (>222M)	6.59***	12.04	10.99***	1.44	14.60	2.66***	47.00	9.49	11.20	3.96**
Areas	Urban	18.60	20.67**	17.18***	5.45	7.10***	2.01***	30.34***	10.78***	14.87***	4.80***
	Rural	16.62	30.42**	22.50***	6.18	51.66***	19.20***	76.88***	43.02***	23.59***	19.23***
Islands	Java	17.41	24.49***	18.37***	6.18	18.22***	5.29***	42.53***	17.80***	18.40***	8.22***
	Outside of Java	16.81	31.41***	23.19***	4.94	52.76***	16.71***	77.54***	37.25***	22.67***	16.28***
Total		17.05	29.54	21.42	5.72	37.02	10.28	61.58	26.30	20.72	11.74

Note: The differences within each subgroup were tested using ANOVA. *** is significant at 0.01, ** is significant at 0.05. Total number of children is 21,396.

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